



SUB-COMMITTEE ON SHIP DESIGN AND EQUIPMENT 43rd session Agenda item 18

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REPORT TO THE MARITIME SAFETY COMMITTEE

Attached is Part 1 of annex 2 to the report of the forty-third session of the Sub-Committee (DE 43/18), containing draft MSC circular on Standardized life-saving appliance evaluation and test report forms, together with sections 1, 2, and 3 of the annex thereto. Parts 2 and 3 of annex 2 are attached to documents DE 43/18/Add.3 and DE 43/18/Add.4 respectively.

ANNEX 2 (Part 1)

DRAFT MSC CIRCULAR

STANDARDIZED LIFE-SAVING APPLIANCE EVALUATION AND TEST REPORT FORMS

- 1 The Maritime Safety Committee, [at its seventy-third session (27 November to 6 December 2000)], approved Standardized life-saving appliance evaluation and test report forms, as set out in the annex.
- The annexed forms were developed on the basis of the requirements of the International Life-Saving Appliance (LSA) Code and resolution MSC. 81(70) on Revised Recommendation on testing of life-saving appliances, with a view to providing guidance on how to conduct tests, record test data and verify tests. It is intended that, after sufficient experience is gained, the forms could be amalgamated with resolution MSC. 81(70).
- 3 The use of the annexed forms will be of benefit to Administrations and other parties, such as manufacturers, test facilities, owners and surveyors, and will be of major help in mutually accepting the type approval of appliances approved by other Administrations.
- 4 Member Governments are invited to bring the annexed forms to the attention of all parties concerned with approving, manufacturing and testing life-saving appliances and encourage them to use the forms.

ANNEX

STANDARDIZED LIFE-SAVING APPLIANCE EVALUATION AND TEST REPORT FORMS

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1 INTRODUCTION

Reference

The attached standardized life-saving appliance evaluation and test report forms have been developed on the basis of the requirements of the International Life-Saving Appliance (LSA) Code, the Revised Recommendation on testing of life-saving appliances (resolution MSC.81(70)) and the Recommendation on means of rescue on ro-ro passenger ships (MSC/Circ.810). Mainly, the tests described in MSC.81(70) constitute the Test Procedures and the LSA Code sets the Acceptance Criteria.

Status

The evaluation and test report forms are guidelines on how to conduct tests, record test data and verify tests. These forms are not intended to change the standards given in the LSA Code and resolution MSC.81(70). In the case of inconsistency between the forms and the LSA Code or resolution MSC.81(70), the text of the Code/resolution should prevail over that of the forms.

Interim period

After sufficient experience is gained with the use of the forms over several years, the evaluation and test report forms could be amalgamated with resolution MSC.81(70).

Layout

Each Administration may use electronically distributed evaluation and test report forms as the basis for customisation of layout reflecting the profile of the Approving body, without changing the original contents.

Internal References

The evaluation and test report forms should be stand-alone documents. Thereby all references in the original text have been replaced by either the full-length text or a reference to other relevant evaluation and test report forms. However, in some of the forms, external references are kept for updating purposes.

Documentation of tests

For approval purposes, all detailed records of test data are to be enclosed with the report forms.

Verification of tests

Each test is to be verified passed or failed by the surveyors' initials and date of testing. Each page is to be verified on completion by surveyors' signature and its date of completion.

Reporting of type approval

To facilitate unified reporting procedures, the completed evaluation and test report forms are to be seen as a documented verification of required type approval tests for each type of equipment. When documentation of type approval is required by a third party the verified evaluation and test report forms should constitute the complete documentation of the type approval together with the relevant approval certificates.

2 PERSONAL LIFE-SAVING APPLIANCES

2.1 LIFEBUOYS AND ASSOCIATED EQUIPMENT

2.1.1 LIFEBUOYS

EVALUATION AND TEST REPORT

2.1.1.1	Submitted drawings, reports and documents
2.1.1.2	Quality assurance
2.1.1.3	Visual inspection
2.1.1.4	Temperature cycling test
2.1.1.5	Drop Test
2.1.1.6	Test for oil resistance
2.1.1.7	Fire Test
2.1.1.8	Flotation Test
2.1.1.9	Strength Test
2.1.1.10	Test for operation with a light and smoke signal

2.1.1 LIFEBUOYS

EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

					Page
	Manufacturer	:	Date:	Time:	
Lifebuoys	Model:		Surveyor:		
	Lot/Serial Nu	mber:	Organization:		
2.1.1.1 Submitted	d drawings, reports and d	locuments			_
		Submitted drawings	s and documents		Status
Drawing No.	Revision No. & date		Title of drawing		
	•				
		Submitted reports	and documents		Status
Report/Document No.	Revision No. & Date		Title of report / document		
		Maintenance Manual -			
		Operations Manual -			
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	Manufacturer:	Date:	_ Time:
Lifebuoys	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.1.2 Quality Assurance	Regulations: MSC.81(70) 2/1.1.1,2	
Except where all appliances of a particular type are required by chapter III of the International Convention for the Safety of Life at Sea, 1974, as amended, or the International Life-Saving Appliance (LSA) Code, to be inspected, representatives	Quality Assurance	
of the Administration should make random inspection of manufacturers to ensure that the quality of life-saving appliances and the materials used comply with the	Standard Used: Passed/ Failed	
specification of the approved prototype life-saving appliance.	Quality Assurance Procedure Passed/ Failed	
Manufacturers should be required to institute a quality control procedure to ensure that life-saving appliances are produced to the same standard as the prototype life-saving appliance approved by the Administration and to keep records of any production tests carried out in accordance with the Administration's instructions.	Quality Assurance Manual Passed/ Failed	

	Manufacturer:	Date:	Time:
Lifebuoys	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.1.3 Visual inspection	Regulations: LSA (Code 1.2.2
Test Procedure	Acceptance Criteria	Significant Test Data
Visually inspect the lifebuoy. Conduct measurements and verify characteristics as	Highly visible colour to assist in detection.	Colour(s):
required.		Passed Failed
	Fitted with approved retro-reflective material in compresolution A.658(16).	pliance with Quantity: Spacing:
		Passed Failed
	Clearly marked with approval information from the of that approved it and any operational restrictions.	Organization Any operational restrictions? Passed Failed
		Comments/Observations

Tuge 10	Manufacturer:	Date:	Time:
Lifebuoys	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.1.3 Visual inspection	Regulations: LSA Code 2.1.1	
Test Procedure	Acceptance Criteria	Significant Test Data
It should be established by measurement, weighing and inspection that:	Be constructed of inherently buoyant material; it should not depend upon rushes, cork shavings or granulated cork, any other loose granulated material or any air compartment which depends on inflation for buoyancy.	Construction materials :
Measure the inner and outer diameter	Should have an outer diameter of not more than 800 mm and an inner diameter of not less than 400 mm	Outer diameter : mm Inner diameter : mm
Weigh the lifebuoy	Not designed for quick release: Should have a mass of not less than 2.5 kg	Mass: kg
If it is intended to operate the quick-release arrangement provided for a self-activated smoke signal and self-igniting light, conduct the test in 2.1.1.10.	If it is intended to operate the quick-release arrangement provided for the self-activated smoke signals and self-igniting lights, have a mass sufficient to operate the quick-release arrangement or 4 kg whichever is greater.	Type / description of quick release arrangement: Does the lifebuoy have sufficient mass to activate the quick-release arrangement for a self-activated smoke signal and self-igniting light? Passed/ Failed Weight: kg
Measure the lifebuoy grab-line diameter and length and assess how it is secured	Be fitted with a grab-line not less than 9.5 mm in diameter and not less than four times the outside diameter of the body of the buoy in length. The grab-line should be secured at four equidistant points around the circumference of the buoy to form four equal loops.	Grab-line diameter: mm Grab-line length: mm Buoy outer diameter times four: mm Grab-line four times the outer diameter of body? Passed/ Failed Grab-line secured in four equal loops? Passed/ Failed
		Comments/Observations

2.1.1.4	Temperature cycling test	Regulations: LSA Code 1.2.2; MSC.81(70) 1/1.2	
	Lot/Serial Number:	Organization:	
Lifebuoys	Model:	Surveyor:	
	Manufacturer:	Date: Time:	
			Page 11

2.1.1.4 Temperature cycling test	Re	egulations: LSA Code 1.2.2; M	ISC.81(70) 1/1.2	
Test Procedure	Acceptance Cr	riteria	Sign	nificant Test Data
The following test should be carried out on two lifebuoys.	Not be damaged in stowage througho 30°C to + 65°C	out the air temperature range -	Passed	Failed
Two lifebuoys should be alternately subjected to surrounding temperatures of -30°C and +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of 10 cycles, is acceptable:	The lifebuoys should show no sign of temperatures and, after the tests, sho such as shrinking, cracking, swelling mechanical qualities.	ould show no sign of damage	(See following page for Intact after this test? Observations Observations	for test data)
An 8 h cycle at +65°C to be completed in one day			Observations	
The specimens removed from the warm chamber that same day and left exposed under ordinary room conditions until the next day			Observations	
An 8 h cycle at -30°C to be completed the next day			Intact after these tests lifebuoy No.1:	? Passed/ Failed
The specimens removed from the cold chamber that same day and left exposed under ordinary room conditions until the next day.			lifebuoy No.2: Comments/Observation	Passed/ Failed

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	Manufacturer:	Date:	Time:
Lifebuoys	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.1.4	Temperature cycling test – Test data		Regulations: LSA Code I/1.2.2; MSC.81(70) 1/1	.2
	НО	T CYCLE	C	OLD CYCLE
Cycle 1	Date In: Time In : Temperature : OC	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration :hours
Cycle 2	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration :hours
Cycle 3	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration :hours
Cycle 4	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration :hours
Cycle 5	Date In: Time In : Temperature : C	Date Out: Time Out:hours	Date In: Time In : Temperature : OC	Date Out: Time Out: hours
Cycle 6	Date In: Time In : Temperature : C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: hours
Cycle 7	Date In: Time In : Temperature : C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: hours
Cycle 8	Date In:	Date Out:	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration :hours
Cycle 9	Date In:	Date Out: Time Out: Duration :hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration :hours
Cycle 10	Date In: Time In : Temperature : C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0C	Date Out: Time Out: hours

	Manufacturer:	_ Date:	Time:
Lifebuoys	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.1.5 Drop test	Regulations: LSA Code 2.1.1.6;	MSC.81(70) 1/1.3	
Test Procedure	Acceptance Criteria	Significant Test Data	
The two lifebuoys should be dropped into the water from the height at which they are intended to be stowed on ships in their lightest seagoing condition, or 30 m, whichever is the greater, without suffering damage.	Be constructed to withstand a drop into the water from the height at which it is stowed above the waterline in the lightest seagoing condition or 30 m, whichever is the greater, without impairing either its operating capability or that of its attached components.	Number of lifebuoys: Lifebuoy no. 1 Drop height in water: m Number of drops: m Passed/ Failed	
	One lifebuoy should withstand three drops from a height of 2m on to a concrete floor.	Lifebuoy no. 2 Drop height in water: m Number of drops: m Passed/ Failed Condition lifebuoy no. 1:	
		Condition lifebuoy no. 2: Passed/ Failed Comments/Observations	

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	Manufacturer:	Date:	Time:
Lifebuoys	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.1.6 Test for oil resistance Regulations: LSA Code 1.2.2;		MSC.81(70) 1 / 1.4	
Test Procedure	Acceptance Criteria	Significant Test Data	
One of the lifebuoys should be immersed horizontally for a period of 24 h under a 100 mm head of diesel oil at normal room temperature.	After this test the lifebuoy should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.	Lifebuoy No. Diesel oil head: mm Duration: hours Signs of damage? Passed Failed Comments/Observations	
2.1.1.7 Fire test	Regulations: LSA Code 2.1.1.5	; MSC.81(70) 1/1.5	
Test Procedure	Acceptance Criteria	Significant Test Data	
The other lifebuoy should be subjected to a fire test. A test pan 30 x 35 x 6 cm should be placed in an essentially draught-free area. Water should be put in the bottom of the test pan to a depth of 1 cm followed by enough petrol to make a minimum total depth of 4 cm The petrol should then be ignited and allowed to burn freely for 30 s. The lifebuoy should then be moved through flames in an upright, forward, free-hanging position, with the bottom of the lifebuoy 25 cm above the top edge of the test pan so that the duration of exposure to the flames is 2 s.	The lifebuoy should not sustain burning or continue melting after being removed from the flames.	Lifebuoy No. Dimensions test pan:x cm Water depth: cm Depth incl. petrol: cm Exposure time: seconds Sustain burning or continue melting after being removed from the flame Passed/ Failed Comments/Observations	

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Manufactu	rer:	Date:	Time:
Lifebuoys Model:		Surveyor:	
Lot/Serial	Number:	Organization:	
		<u>-</u>	
2.1.1.8 Flotation Test		Regulations: LSA Code 2.1.1.3;	; MSC.81(70) 1/1.6
Test Procedure	Acceptano	ce Criteria	Significant Test Data
The two lifebuoys subjected to the above tests should be floated in fresh water with not less		s or permanent deformation. The	Lifebuoy no. 1 Lifebuoy no. 2
than 14.5 kg of iron suspended from each of them and should remain floating for a period of		r	Suspended mass: kg kg
24 h.			Float duration: min min
			Intact after this test? Passed/ Failed
			Float for entire test period? Passed/ Failed
			Comments/Observations
2.1.1.9 Strength Test		Regulations: LSA Code 1.2.2;	MSC.81(70) 1/1.7
Test Procedure	Acceptano	ce Criteria	Significant Test Data
A lifebuoy body should be suspended by a 50		s or permanent deformation.	Lifebuoy No.
mm wide strap. A similar strap should be passed around the opposite side of the body			Suspended mass: kg
with a 90 kg mass suspended from it. After 30 min, the lifebuoy body should be examined.			Suspension duration : min
			Passed/Failed
			Comments/Observations
			Comments, Observations

1 age 10			
	Manufacturer:	Date:	Time:
Lifebuoys	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.1.10 Test for operation with a light and smoke signal		llations: LSA Code 2.1.1.7;	MSC.81(70) 1/1.8
Test Procedure	Acceptance Criter	eria	Significant Test Data
The tests should be carried out if the lifebuoy is intended for quick release with a light and smoke signal. The lifebuoy should be arranged in a manner simulating its installation on a ship for release from the navigating bridge. A lifebuoy light and smoke signal should be attached to the lifebuoy in the manner recommended by the manufacturers.	The lifebuoy should be released and sho and the smoke signal. The weight of the lifebuoy should be at least the should be at least to be a signal of the lifebuoy should be at least to be a signal		Lifebuoy Bo. Type / description of quick activating arrangement: Type of light and smoke signal: Light activated? Passed/ Failed Smoke activated? Passed/ Failed, Weight of the lifebuoykg Length of the line connected to the lifebuoym Passed Failed Comments/Observations

2.1.2 LIFEBUOY SELF-IGNITING LIGHTS

EVALUATION AND TEST REPORT

Remark: If a Lifebuoy Self-Igniting Light is a combined Light/Smoke Signal it should be treated as a sole Lifebuoy Self-Igniting Light.

2.1.2.0	General Information		
	2.1.2.0.1 General Data and Specifications2.1.2.0.2 Drawings and Manuals		
2.1.2.1	Visual Inspection		
	 2.1.2.1.1 Approval Marking 2.1.2.1.2 Expiry Marking 2.1.2.1.3 Additional Markings 2.1.2.1.4 Electrical Short Circuit Protection 2.1.2.1.5 Construction and Materials 		
2.1.2.2	Temperature Cycling Test		
2.1.2.3	Light Tests		
2.1.2.4	Chromaticity Test		
2.1.2.5	Rain Test and Watertightness Test		
2.1.2.6	Case Resistance Test		
2.1.2.7	Dome Drop Test		
2.1.2.8	Floatation Test		
2.1.2.9	Drop Test		
2.1.2.10	Fitting Test		
2.1.2.11	Release and Operation Test		
2.1.2.12	Vibration Test		
2.1.2.13	Mould Growth Test		
2.1.2.14	Corrosion and Seawater Resistance Test		
2.1.2.15	Solar Radiation Test		
2.1.2.16	Test for Oil Resistance		
2.1.2.17	Fire Test		

2.1.2 LIFEBUOY SELF-IGNITING LIGHTS

EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

	Manufacturer:	Date:	Time:
Lifebuoy Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.2.0.1 General Data and Specifications	Regulations: LSA Code; MSC.	81(70)
General Information	Lifejacket Light Dimensions	Lifejacket Light Weight
TYPE OF SWITCHING		
FLASHING LIGHT		Comments/Observations
STEADY LIGHT		

Page 20			
	Manufacture	: Date: Time:	
Lifebuoy Lights	Model:	Surveyor:	
	Lot/Serial Nu	mber:Organization:	
2.1.2.0.2 Submittee	d drawings, reports and o	locuments	
		Submitted drawings and documents	Status
Drawing No.	Revision No. & date	Title of drawing	
	•		
		Submitted reports and documents	Status
Report/Document No.	Revision No. & Date	Title of report / document	
		Maintenance Manual -	

Operations Manual -

			1 480 2 1
	Manufacturer:	_ Date:	Time:
Lifebuoy Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.2.1 Visual Inspection		Regulations: LSA Code 1.2.2.1/1.2.2.6/1.2.2.9/1.2.2.10/1.2.3		
Test Procedure	Acceptance Criteria		Significant Test Data	
Thirteen lifebuoy self-igniting lights should be examined in detail for the following items:	The lifebuoy self-igniting lights sho	ould:	Results: PASS:	FAIL:
Approval marking	•	approval information including the pproved it, and any operational expiry;	PASS:	FAIL:
Expiry marking		ne the use to deterioration with age. The ustified by the manufacturer	Results: PASS:	FAIL:
Additional markings	igniting light"); serial number; identification of the manu where applicable, inform	ded use (e.g. "Lifebuoy self- facturer; ation on proper battery disposal NOT INCINERATE / DO NOT	Results: PASS: PASS: PASS: PASS: PASS:	FAIL: FAIL: FAIL: FAIL:
Electrical short circuit protection	- be provided with electrica damage or injury;	al short circuit protection to prevent	Results: PASS: Comments/Observations	FAIL:

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	Manufacturer:	Date: Time:	
Lifebuoy Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.2.1 Visual Inspection (continued)			Regulations: LSA Code 1.2.2.1/1.2.2.6/1.2.2.9/1.2.2.10/1.2.3			
Acceptance Criteria		Significant Test Data				
The lifebuoy self-igniting lights sho	ould:	Results:				
- be constructed with prope	er workmanship and materials.	PASS:	FAIL:			
		Comments/Observations				
	The lifebuoy self-igniting lights sho	Acceptance Criteria The lifebuoy self-igniting lights should:	Acceptance Criteria Significant The lifebuoy self-igniting lights should: - be constructed with proper workmanship and materials. PASS:			

	Manufacturer:		Date:		Time:	
Lifebuoy Lights	Model:		Surveyor:			
	Lot/Serial Number:		Organization:			
	LIGHTS TEST FLOWCHART 1 2 1EMP CYCLING TEST - 3 - 4 - 5 - 6 - 30m DROP TE 7 WERATION TE	2.1.2.3 	CHROMATICITY TEST [BOTH UNITS] RAIN AND WATER TIGHTNESS TESTS 21.25 CASE RESISTANCE TEST 2.1.2.6 CASE RESISTANCE TEST 2.1.2.7 DONE DROP TEST 2.1.2.8 2.1.2.10 HITING TEST		2.1.2.11 Operation test	
	CORROSI	ON AND SEAVATER RESISTA (Maybe vanved see N				
	-11	SOLAR RADIATION TO [NAYBE WAVED SEE NOT				
	- 12 ——————————————————————————————————	OIL RESISTANCE TES 2.1.21 Fire test	7	——————————————————————————————————————		
				•		

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	Manufacturer:	Date:	Time:	
Lifebuoy Lights	Model:	Surveyor:		
	Lot/Serial Number:	Organization:		

2.1.2.2 Temperature Cycling Test		Regulations: LSA Code 1.2.2.2; MS	SC.81(70) 1/1.2, 1.2.1, 1.2.2, 10.2	2, 10.2.1
Test Procedure	Acceptano	ce Criteria	Significar	nt Test Data
Three lifebuoy self-igniting lights should be alternately subjected to surrounding temperatures of not less than – 30°C and at least +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of not less than 10 cycles, is acceptable: 1. at least an 8 h cycle at not less than +65°C to be completed in one day; and 2. the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions until the next day; 3. at least an 8 h cycle at not less than 30°C to be completed the next day; and 4. the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions until the next day.	the air temperature range of at least -30 lights should show no sign of loss of after the tests, should show no sign o	not be damaged in stowage throughout 0°C to +65°C. The lifebuoy self-igniting rigidity under high temperatures and, of damage such as shrinking, cracking, echanical qualities and should function	Results: Attach temperature cycling char Each temperature. PASS: Comments/Observations	rt to record times spent at FAIL:

			C
	Manufacturer:	_ Date:	Time:
Lifebuoy Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.2.2	2.1.2.2 Temperature cycling test – Test data			Regulations: LSA Code I/1.2.2; MSC.81(70) 1/1.2		
	HOT CYCLE			COLD CYCLE		
Cycle 1	Date In: Time In : Temperature :		Date Out: Time Out:hours	Date In: Time In : Temperature :	oC	Date Out: Time Out: Duration :hours
Cycle 2	Date In: Time In : Temperature :		Date Out: Time Out:hours	Date In: Time In : Temperature :		Date Out: Time Out: Duration :hours
Cycle 3	Date In: Time In : Temperature :		Date Out: Time Out:hours	Date In: Time In : Temperature :		Date Out: Time Out: Duration :hours
Cycle 4	Date In: Time In : Temperature :		Date Out: Time Out:hours	Date In: Time In : Temperature :		Date Out: Time Out: Duration :hours
Cycle 5	Date In: Time In : Temperature :		Date Out: Time Out:hours	Date In: Time In : Temperature :	oC	Date Out: Time Out: Duration :hours
Cycle 6	Date In: Time In: Temperature:		Date Out: Time Out:hours	Date In: Time In : Temperature :		Date Out: Time Out: Duration :hours
Cycle 7	Date In: Time In : Temperature :	_	Date Out: Time Out:hours	Date In: Time In : Temperature :		Date Out: Time Out:hours
Cycle 8	Date In: Time In : Temperature :		Date Out: Time Out:hours	Date In: Time In: Temperature:		Date Out: Time Out: Duration : hours
Cycle 9	Date In: Time In : Temperature :		Date Out: Time Out:hours	Date In: Time In: Temperature:	oC	Date Out: Time Out: Duration:hours
Cycle 10	Date In: Time In : Temperature :		Date Out: Time Out: Duration :hours	Date In: Time In : Temperature :		Date Out: Time Out: Duration :hours

1 age 20			
	Manufacturer:	Date:	Time:
Lifebuoy Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

gniting lights should not be ng for at least an hour longer. All luminous intensity data is to be attached here. All luminous intensity data is to be attached here. All luminous intensity data is to be attached here. FAIL:
All luminous intensity data is to be attached here. All luminous intensity data is to be attached here. All luminous intensity data is to be attached here. All luminous intensity data is to be attached here. All luminous intensity data is to be attached here.
s intensity.) PASS: FAIL: Comments/Observations

					Page 2'
	Manufactur	er:	Date:	Time:	
Lifebuoy Lights	Model:		Surveyor:		
	Lot/Serial N	lumber:	Organization:		
2.1.2.3 Light Tests	s (continued)		Regulations: LSA Code 2.1.2/2.	1.2.2/2.1.2.3; MSC.81(70) 1/10	2.2.2, 10.4, 10.4.9
Test Proc	eedure	Acceptano	ce Criteria	Significant 7	Test Data
It must be demonstrated the required luminous intensity upper hemisphere when which is calibrated to the of the appropriate Nation Institute (Note: CIE Publ. I information.). Luminous is should be measured by a the center of the light sour a rotating table. Luminous measured in a horizontal of the center of the light so recorded through a 360 measurement should be tand should continue to be angle at 5° intervals to a 90° (vertical).	y in all directions of the using a photometer photometric standards nal or State Standard No. 70 contains further intensity of both lights photometer directed at ce with the test light on us intensity should be direction at the level of burce and continuously 0° rotation. The first aken at 0° (horizontal) e taken in the azimuth	The effective luminous intensity is $\left[\frac{\int_{t_1}^{t_2} I dt}{0.2 + (t_2 - t_1)}\right]_{\text{max}}$ where: I is the instantaneous intensity, 0.2 is the Blondel - Rey constant integration in seconds.	to be found from the formula : $t \ \text{and} \ t_1 \ \text{and} \ t_2 \ \text{are time - limits of}$	Passed Comments/Observations	Failed
90° (vertical). Luminous intensity should be measured in a vertical direction, beginning at the center of the light source at the point of lowest recorded light output, and continuously recorded through an arc of 180°. Note: Flashing lights with a flash above 2 cd, not including incande fixed lights for the measurement should provide the required lumin upper hemisphere. (Incandescence		duration of not less than 0.3 s at or scence time, may be considered as of luminous intensity. Such lights ous intensity in all directions of the e time is the time interval between sity reaching the required minimum			

1 agc 20			
	Manufacturer:	Date:	Time:
Lifebuoy Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.2.4 Chromaticity Test Regulations: LSA Code 2.1.2.2;			MSC.81(70) 1/10.2.2, 10.4,	10.4.10
Test Procedure	Acceptance Criteria		Significant Test Data	
Both lifebuoy self-igniting lights which have passed the light tests should be tested for chromaticity to determine that it lies within the boundaries of the area "white" of the diagram specified for each colour by the International Commission on Illumination (CIE). The chromaticities of the lifebuoy self-igniting lights should be measured by means of colorimetric measurement equipment which is calibrated to the appropriate National or State Standards Institute (Note: CIE Publ. No. 15.2 contains further information.). Measurement on at least four points of the upper hemisphere should be taken.	The measured chromaticity coo boundaries of the area of the diagr	ordinates should fall within the ram as per CIE. The boundaries of given by the following corner to 0.00 0.440 0.78 0.382	Results: All chromaticity data is to PASS: Comments/Observations	

				1 1180 = 2
	Manufacturer:	Date:	Time:	
Lifebuoy Lights	Model:	Surveyor:		
	Lot/Serial Number:	Organization:		

2.1.2.5 Rain Test and Watertightness Test Regulations: LS		Regulations: LSA Code 1.2.2.8;	8; MSC.81(70) 1/10.2.5, 10.4.7	
Test Procedure	Acceptance Criteria		Significant Test Data	
One lifebuoy self-igniting light which has passed the temperature cycling test should be subjected to the rain test according to IEC 945, paragraph 8.8. After having passed the rain test, the lifebuoy self-igniting light and its complete power source should be immersed horizontally under not less than 300 mm of fresh water for at least 24 h. After that test, the lifebuoy self-igniting light should be tested for function. After having tested its function, and if it is an electric light, it should be disassembled and examined for the presence of water. Automatic activated version should be prevented from switching during these tests.	The lifebuoy self-igniting light sho used in a seaway, be capable environment.	ould be rot-proof and, if it is to be of satisfactory operation in that ould function after immersion under ould comply with the requirements	Results: PASS: Comments/Observations	rt Test Data

1 age 30			
	Manufacturer:	Date:	Time:
Lifebuoy Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.2.6 Case Resistance Test Regulations: MSC.81(70) 1/1		2.7	
Test Procedure	Acceptance Criteria	Significant Test Data	
One lifebuoy self-igniting light should be placed on its side on a rigid surface and a steel sphere having a mass of 500 g should be dropped from a height of 1.3 m on to the case at least three times. The sphere should strike the case near its centre on one drop, approximately 12 mm from one end of the case on another drop and approximately 12 mm from the other end of the case on the third drop.	The case should not break or crack, or be distorted in a way that would affect its watertightness. The lifebuoy self-igniting light should function after the test.	Results: PASS: FAIL: Comments/Observations	
2.1.2.7 Dome Drop Test	Regulations: MSC.81(70) 1/10.2.6		
Test Procedure	Acceptance Criteria	Significant Test Data	
If a lifebuoy self-igniting light has a dome, it should be subjected to the dome drop test. The lifebuoy self-igniting light should be cooled to -18°C and dropped twice from a height of 1 m on to a rigidly mounted steel plate or concrete surface. The distance should be measured from the top of the dome to the impact surface. The lifebuoy self-igniting light should strike the surface on the top centre of the dome.	The dome should not break or crack. The lifebuoy self-igniting light should function after the test.	Results: PASS: FAIL: Comments/Observations	

				1 480 0 1
	Manufacturer:	Date:	Time:	
Lifebuoy Lights	Model:	Surveyor:		
	Lot/Serial Number:	Organization:		

2.1.2.8 Floatation Test Regulations: LSA Code 1.2.2.8;		; MSC.81(70) 1/10.2.4	
Test Procedure	Acceptance Criteria	Significant Test Data	
One lifebuoy self-igniting light should be subjected to the floatation test. If the unit has an automatic activation, it should be disabled during	The lifebuoy self-igniting light should be capable of satisfactory operation in a seaway.		
this test.	The lifebuoy self-igniting light should function after the test and there should be no evidence of water inside the lifebuoy self-igniting light.	PASS: FAIL:	
The lifebuoy self-igniting light should be allowed to float in water in its normal operating position for 24 h.		Comments/Observations	
If the lifebuoy self-igniting light is an electric light, it should be disassembled at the end of the tests and examined for the presence of water.			

1 age 32			
	Manufacturer:	Date:	
Lifebuoy Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.2.9 Drop Test Regulations: LSA Code 2.1.2.4/2		2.1.2.4/2.1.1.6; MSC.81(70) 1/1.3, 10.2.3
Test Procedure	Acceptance Criteria	Significant Test Data
One lifebuoy self-igniting light which has passed the visual inspection should be subjected to the drop test.	The lifebuoy self-igniting light should withstand this test impairing either its operating capability or that of its a components.	attached
The lifebuoy self-igniting light should be subjected to at least two drop tests as follows:	The lifebuoy self-igniting light should not suffer damage and operate satisfactorily after each drop.	should PASS: FAIL:
The lifebuoy self-igniting light should be dropped into the water from a height of at least 30 m. The lifebuoy self-igniting light should be dropped twice, first by itself and then attached to a lifebuoy. On sea activated lights this test should be carried out with the sealing plugs fitted to prevent the ingress of water which will cause the light to operate. After having passed the drop test the light should be		Comments/Observations
subjected next to the fitting test. 2.1.2.10 Fitting Test	Regulations: MSC.81(7	0) 1/10.2.8
Test Procedure	Acceptance Criteria	Significant Test Data
The lifebuoy self-igniting light which has passed the drop test should be subjected to the fitting test. A force of 225 N should be applied to the fitting and lanyard that attaches the lifebuoy self-igniting light to a lifebuoy. After having passed the fitting test the light should be subjected to the release and operation test.	Neither the fitting and lanyard nor the lifebuoy self-igniting should be damaged as a result of this test. The lifebuoy self-igniting light should function after the test.	ng light Results: PASS: FAIL: Comments/Observations

					Page 3	
	Manufacture	er:	Date:	Time:_		
Lifebuoy Lights	Model:		Surveyor:			
	Lot/Serial N	Number:	Organization:			
2.1.2.11 Release and Operation Test			Regulations: LSA Code 2.1.1.7; MSC.81(70) 1/1.8			
Test Proceed	dure	Acceptano	Acceptance Criteria		Significant Test Data	
One lifebuoy intended for q lifebuoy self-igniting light of fitting test and a smoke sig this test. The chemical in produce the smoke should equivalent non-dangerous m should be arranged in a m installation on a ship for navigating bridge. The lifebuand a smoke signal should lifebuoy in the manner remanufacturer. The lifebuoy s	which has passed the gnal should be given material intended to be substituted by an material. The lifebuoy manner simulating its or release from the most self-igniting light display be attached to the ecommended by the	The lifebuoy should activate the lif	ebuoy self-igniting light.	Results: PASS: Comments/Observations	FAIL:	
2.1.2.12 Vibration Te	est	Regulations: LSA Code 1.2.2.1/		1.2.2.8; MSC.81(70) 1/10.4, 10.4.1		
Test Proced	dure	Acceptance Criteria		Significant Test Data		
One lifebuoy self-igniting li the visual inspection shoul vibration test according to IE	ld be subjected to a	The lifebuoy self-igniting light should be constructed with proper workmanship and materials The lifebuoy self-igniting light should function after the test.		PASS: Comments/Observations	FAIL:	

1 age 34			
	Manufacturer:	Date:	Time:
Lifebuoy Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.2.13 Mould Growth Test Regulations: LSA Code 1.2.2			; MSC.81(70) 1/10.4, 10.4.2		
Test Procedure	Acceptance Criteria		Significant Test Data		
One lifebuoy self-igniting light which has passed the visual inspection should be subjected to the mould growth test.	The lifebuoy self-igniting light should be affected by fungal attack.	rot-proof and not be unduly	Results:		
The lifebuoy self-igniting light should be inoculated by spraying with an aqueous	an aqueous lifebuoy self-igniting light should function after the test.		PASS:	FAIL:	
suspension of mould spores containing all the following cultures:			Comments/Observations		
Aspergillus niger; Aspergillus terreus; Aureobasidium pullulans; Paecilomyces variotii; Penicillium funiculosum; Penicillium ochrochloron; Scopulariopsis brevicaulis; and Trichoderma viride.					
The lifebuoy self-igniting craft light should then be placed in a mould growth chamber which should be maintained at a temperature of 29°C +/-1°C and a relative humidity of not less than 95 %. The period of incubation should be 28 days. After this period the lifebuoy self-igniting light should be inspected.					
(Note: The mould growth test may be waived where the manufacturer is able to produce evidence that the external materials employed will satisfy the test.)					

					r uge 5.
	Manufactur	er:	Date:	Time:	
Lifebuoy Lights	Model:		Surveyor:		
	Lot/Serial N	Number:	Organization:		
21214 Garage	Seawater Resistan	The			
<u> </u>		1	Regulations: LSA Code 1.2.2.4;	1	
Test Procedur	re	Acceptance	ce Criteria	Significant	Test Data
One lifebuoy self-igniting light the visual inspection should corrosion and seawater resista to IEC 945, paragraph 8.12.	be subjected to a	be unduly affected by seawater.	ould be corrosion resistant and not	Results: PASS:	FAIL:
(Note: .1 If there are no expose Corrosion and Seawate need not be conducted2 The Corrosion and Se Test may be wai manufacturer is able to that the external meta satisfy the test3 Automatic activated v prevented from switching.	er Resistance Test cawater Resistance eved where the correct produce evidence als employed will eversion should be	lifebuoy self-igniting light should f	in 8.12.2. rioration of metal parts and the function after the test. of the automatic switch sensor, the	Comments/Observations	
2.1.2.15 Solar Radiation	n Test		Regulations: LSA Code 1.2.2.5;	MSC.81(70) 1/10.4, 10.4.5	
Test Procedur	re	Acceptano	ce Criteria	Significant	Test Data
One lifebuoy self-igniting light the visual inspection should solar radiation test according paragraph 8.10. (Note: The solar radiation test where the manufacturer is evidence that the materials emitthe test, i.e. UV stabilized.)	be subjected to a ng to IEC 945, st may be waived able to produce	sunlight. Furthermore, the mechanical prope	ould be resistant to deterioration by erties and labels should be resistant ght and the lifebuoy self-igniting	Results: PASS: Comments/Observations	FAIL:

1 age 30			
	Manufacturer:	Date:	Time:
Lifebuoy Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.2.16 Test for Oil Resistance		Regulations: LSA Code 1.2.2.4;	MSC.81(70) 1/10.4, 10.4.6		
Test Procedure	Acceptance Criteria		Significant Test Data		
One lifebuoy self-igniting light which has passed the visual inspection should be subjected to the test for oil resistance according to IEC 945 paragraph 8.11. Automatic activated version should be prevented from switching during the test.	After this test the lifebuoy self-ig affected by oil and should show no cracking, swelling, dissolution or complete The lifebuoy self-igniting light should be self-igniting light should	o sign of damage such as shrinking, hange of mechanical qualities.	Results: PASS: Comments/Observations	FAIL:	
2.1.2.17 Fire Test		Regulations: LSA Code 2.1.1.5;	MSC.81(70) 1/10.4,10.4.8		
Test Procedure	Acceptano	ce Criteria	Significant	Test Data	
One lifebuoy self-igniting light which has passed the visual inspection should be subjected to a fire test. A test pan not less than 30 cm x 35 cm x 6 cm should be placed in an essentially draught-free area. Water should be put in the bottom of the test pan to a depth of at least 1 cm followed by enough petrol to make a minimum total depth of not less than 4 cm. The petrol should then be ignited and allowed to burn freely for at least 30 s. The lifebuoy self-igniting light should then be moved through the flames, facing them, with the lifebuoy self-igniting light not more than 25 cm above the top edge of the test pan so that the duration of exposure to the flames is at least 2 s.	The lifebuoy self-igniting light shomelting after being totally envelop than 2 s and after being removed from the lifebuoy self-igniting light shows the lifebuoy self-ignitin	ed in a fire for a period of not less om the flames.	Results: PASS: Comments/Observations	FAIL:	

2.1.3 LIFEBUOY SELF ACTIVATING SMOKE SIGNALS

EVALUATION AND TEST REPORT

2.1.3.1	Submitted drawings, reports and documents
	2.1.3.1.1 Quality assurance2.1.3.1.2 Visual inspection
	2.1.3.1.3 General Data and Specification
2.1.3.2	Temperature cycling test
2.1.3.3	Low Temperature Conditioning Test
2.1.3.4	High Temperature Conditioning Test
2.1.3.5	Ambient Temperature Conditioning and Drop Test
2.1.3.6	Humidity Conditioning
2.1.3.7	Water and Corrosion Resistance Test
	2.1.3.7.1 Immersed for 24 h under 1 m2.1.3.7.2 Salt Spray Conditioning
2.1.3.8	Heptane Test
2.1.3.9	Laboratory Smoke Obscuration Test
2.1.3.10	Wave Test
2.1.3.11	Attachment Fitting Strength Test
2.1.3.12	Safety Inspection

2.1.3 LIFEBUOY SELF ACTIVATING SMOKE SIGNALS EVALUATION AND TEST REPORT

Manufacturer	
Type/Model	
Date of Approval	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

Lifebuoy Self Activating	Smoke Signals	Model:	Surveyor:	Time:
2.1.3.1 Submitted	drawings, repor	ts and documents		
Submitted drawings and documents				
Drawing No.	Revision No. &	z date	Title of drawing	
		Submitted	reports and documents	Status
Report/Document No.	Revision No. &	z Date	Title of report / document	
		Maintenance Man	ual -	
		Operations Manua	al -	

ruge 10			
	Manufacturer:	Date:	Time:
Lifebuoy Self Activating Smoke Signals	Model:	_Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.3.1.1 Quality Assurance	Regulations: -
Except where all appliances of a particular type are required by Chapter III of the International Convention for the Safety of Life at Sea, 1974, as amended, to be inspected, representatives of the Administration should make random inspections of manufacturers to ensure that the quality of life-saving appliances and materials used comply with the specification of the approved prototype life-saving appliance. Manufacturers should be required to institute a quality control procedure to ensure that life-saving appliances are provided to the same standard as the prototype life-saving appliance approved by the Administration and to keep records of any production tests carried out in accordance with the Administration's instructions.	Quality Assurance Standard Used: - Quality Assurance Procedure: - Quality Assurance Manual: - Description of System.
	Quality Assurance System acceptable Yes/No
	Comments/Observations

	Manufacturer:	_ Date:	_ Time:
Lifebuoy Self Activating Smoke Signals	Model:	_ Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.3.1.2 Visual Inspection Regulations: LSA Code I/1.2;			MSC.81(70) 1/1.9 and 4.5	
Test Procedure	Acceptano	ce Criteria	Significant Test Data	
Visual examination	Lifebuoy Self-Activating Smoke S	Signal should: -		
Approval markings	be clearly marked with appro Administration which approved in and operational restrictions, mark	t, date of manufacture and expiry	Passed	Failed
Operating instructions.	be provided with brief instruction the use of the lifebuoy self-active casing also the method of manual		Passed	Failed
Outer casing.	not depend on adhesive tapes or resistant properties	plastic envelopes for its water-	Passed	Failed
	be fitted with an integral means of ignition;		Passed	Failed
Ignition System.				
Fitted with light	if fitted with lights be tested in ac Lifebuoy Self-Igniting lights, sect	cordance with the requirements of ion 10.2.	Passed	Failed
Acceptable life	The administration should determ the unit which are subject to deter	nine the period of acceptability of ioration with age.	Comments/Observations	

1 age +2			
	Manufacturer:	Date:	Time:
Lifebuoy Self Activating Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.3.1.3 General Data and Specifications		Regulations: LSA Code I/1.2 &	III/3.1; MSC.81(70) 1/4.6
General Information	Dime	nsions	Weight
Construction Material:	Dimensions:		
Casing:	Length of Casing:		Design Weight:
Top cover (If applicable):	Maximum Diameter of Casin	ıg:	Weight As Tested:
	Minimum Diameter of Casing	g	Weight of Smoke Material
Bottom Cover (If applicable):			
Method of Ignition			Comments/Observations
Operational Safety Delay (if Applicable)			
Number of lights (if Applicable)			
Type of lens dome			
Amperage of Bulb			
Number of Batteries			
Voltage of Batteries			
Acceptable life of the item			
yrs			

LIFEBUOY SELF ACTIVATING SMOKE SIGNAL CONDITIONING & SEQUENCE TEST CHART

	Manufacturer:	_ Date:	
Lifebuoy Self Activating Smoke Signals	Model:	_ Surveyor:	
	Lot/Serial Number:	Organization:	

TEST ITEMS									REFERENCES	REMARKS
CONDITIONIN G SEQUENCE										
	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22	MSC 81(70)	
Measuring dimensions and mass	A	A	A	A	A	A	A	A		
Temperature cycling test (2.1.3.2)	В	В	В						1.9.1 & 1.2.1.	
Low temperature conditioning (2.1.3.3)	С								1.9.2	
High temperature conditioning (2.1.3.4)		С							1.9.2	
Ambient temperature conditioning (2.1.3.5)			С						1.9.2	
Operate Immersed under 25mm for 10 secs (2.1.3.4)		С							1.9.2	
Humidity conditioning (2.1.3.6)				С					1.9.4 & 4.2.4	
1 metre for 24 hours (2.1.3.7.1)					С				1.9.4 & 4.3.1	
Salt water spray (2.1.3.7.2)						С			1.9.4 & 4.3.3	
Safety inspection (2.1.3.12)	D	D	D	D	D	D	D	D	4.5	
Operation at ambient temperature			Е		Е	Е	Е	Е	1.9.3, 4.3.1	

Tage 44	Manufacturer:	_ Date:	Time:
Lifebuoy Self Activating Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

LIFEBUOY SELF ACTIVATING SMOKE SIGNAL CONDITIONING & SEQUENCE TEST CHART (continued)

Specimen No>	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22	References	Remarks
Operate at conditioning Temperature	Е	Е		Е					1.9.2, 4.2.4	
Heptane test (2.1.3.8)							F		1.9.4 & 4.8.2	
Attachment fitting strength (2.1.3.11)	F	F							10.2.8	May be carried out by an independent laboratory acceptable to the administration and report submitted. Use specimens 1 and 4
Wave height test (2.1.3.10)								F	1.9.5	
30 m drop test (2.1.3.5)			Н						1.9.3	
Smoke colour and emission time 15 minutes minimum	G	G	G	G	G	G	G	G	1.9.2 & 1.9.3	
Smoke obscuration (2.1.3.8)									4.8.3	May be carried out by an independent laboratory acceptable to the administration and report submitted.

Note: The letters in the above `boxes' refer to the sequence of testing of each specimen Lifebuoy Self Activating Smoke Signal.

						Page 4:
	Manufacturer:	Date:		Time	:	
Lifebuoy Self Activating Smoke Signals	Model:	Surveyor:				
	Lot/Serial Number:	Organization:				
2.1.3.2 Temperature cycling test		Regulations: LSA Code I/1.2.2;	MSC.81(70)) I/1.9 – 1.2.1		
Test Procedure	Acceptan	nce Criteria		Significant T	est Data	
Nine self-activating smoke signals shou		should be inspected and should	Specimen N	No.		
alternately subjected to surrous temperatures of -30°C and +65°C.	These dissolution or change of mechani	as shrinking, cracking, swelling, ical properties.	1. Pa	assed	Failed	
alternating cycles need not follow immed	edure,		2. Pa	assed	Failed	
repeated for a total of 10 cycles, is accepta			3. Pa	assed	Failed	
1. an 8 h cycle at +65°C to be complet one day; and	ted in		4. Pa	assed	Failed	
2. the specimens removed from the			5. Pa	assed	Failed	
chamber that same day and left expunder ordinary room conditions unt			6. Pa	assed	Failed	
next day;			7. Pa	assed	Failed	
3. an 8 h cycle at -30°C to be complete next day; and	ed the		8. Pa	assed	Failed	
4. the specimen removed from the			9. Pa	assed	Failed	
chamber that same day and left expunder ordinary room conditions unt next day;			Comments/	/Observations		
			D1	E-11- 1		
			Passed	Failed		

ruge 10			
	Manufacturer:	_ Date:	_ Time:
Lifebuoy Self Activating Smoke Signals	Model:	_ Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.3.3 Low temperature conditioning test Regulations: LSA Code I/1.2.2;			MSC.81(70) 1/1.9.2			
Test Procedure	Acceptano	ce Criteria	Significant Test Data			
1	Acceptance The 3 specimens should function of cracking, swelling, dissolution or after completing the -30°C condit The signal should not ignite explit to persons close by, nor emit an emission time of at least 15 min. The colour of the smoke should 34, 48, 49 or 50 of the publication Dictionary of Names. *	ce Criteria effectively. sign of damage such as shrinking, change of mechanical properties	Specimen Numbe	Significant Test Data r 2 onditioning (Pass/Fa ime (min/sec) quality (Pass/Fail) ss/Fail)	3	
			Passed	Failed		

					1 480 .
	Manufacturer:	Date:		Time:	
Lifebuoy Self Activating Smoke Signals	Model:	Surveyor:			
	Lot/Serial Number:	Organization:			
		ľ			
2.1.3.4 High temperature conditio		Regulations: LSA Code I/1.2.2 a	and 11/2.1.3; MSC.8	31(70) 1/1.9.2	
Test Procedure	Acceptan	ce Criteria	;	Significant Test Dat	a
After at least ten complete temperature cy three smoke signals should be subjected		effectively.	Specimen Number	r	
temperature of $+65^{\circ}$ C for at least 48 h, taken from this stowage temperature	then Each specimen should show no s	sign of damage such as shrinking, change of mechanical properties	4	5	6
activated and operated in seawater temperature of +30°C, and function effect	at a after completing the +65°C condi		Condition after Co	onditioning (Pass/Fa	ail)
at that temperature.	The smoke signal should r	The smoke signal should not ignite explosively or in a manner dangerous to persons close by nor emit any flame			
	during the entire smoke en				
		en emitting smoke for 7 minutes, moke signals should be immersed			
	to a depth of 25 mm for 10 s. On	being released the smoke signals y quantity of smoke of a highly			
	visible colour at a uniform rate	for a period of not less than 15	Smoke colour (Pas	ss/Fail)	T
	minutes when floating in calm wa	nter.			
		be orange as defined by sections	Smoke emission during submergence (Pass/Fail)		(Pass/Fail)
	34, 48, 49 or 50 of the publication Dictionary of Names. *	n Colour: Universal Language and			
	*Special Publication 440, N Washington, DC 20402, USA.	fational Bureau of Standards,	Comments/Observ	vations	
			Passed F	Failed	-

1 age 40			
	Manufacturer:	Date:	Time:
Lifebuoy Self Activating Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.3.5 Ambient Temperature Condition	2.1.3.5 Ambient Temperature Conditioning & Drop Test Regulations: LSA Code I/1.2.2 & II			31(70) 1/1.9.3		
Test Procedure	Acceptanc	Significant Test Data				
After at least ten complete temperature cycles three smoke signals taken from ordinary room	The 3 specimens should function of	effectively.	Specimen No.			
conditions and attached by a line to a lifebuoy should undergo a drop test.	Each specimen should show no s cracking, swelling, dissolution or		7	8	9	
	after completing the +65°C condit		Condition after Co	onditioning (Pass/Fa	il)	
A lifebuoy and the smoke signal should be dropped each into the water from the height at which they are intended to be stowed on ships in their lightest seagoing condition, or 30 m, whichever is the greater, without suffering damage The lifebuoy and smoke signals should be dropped from a quick release fitting used for		ot ignite explosively or in a ons close by nor emit any flame	Drop height (metr	e)		
	The colour of the smoke should 34, 48, 49 or 50 of the publication Dictionary of Names. *	Smoke emission to	ime (min/sec)			
housing the signals.	*Special Publication 440, N	ational Bureau of Standards,	Smoke emission q	uality (Pass/Fail)		
	Washington, DC 20402, USA.		C	/T-:1)		
			Smoke colour (Pas	I		
			Comments/Observ	vations		

					r age i
Man	ufacturer:	Date:		Time:	
Lifebuoy Self Activating Smoke Signals Moo	lel:	Surveyor:			
Lot/	Serial Number:	Organization:			
2.1.3.6 Humidity conditioning		Regulations: LSA Code I/1.2.2 &	& II/2.1.3; MSC.81	(70) 1/4.2.4	
Test Procedure	Acceptance	ee Criteria		Significant Test Data	
Three specimens of smoke signals should be	The 3 specimens should function e	effectively.	Specimen No.		
subjected to a temperature of +65°C and 90% relative humidity for at least 96 h, followed by ten days at 20°C to 25°C at 65% relative	Each specimen should show no s cracking, swelling, dissolution or		10	11	12
humidity.	after completing the +65°C condit		Condition after Conditioning (Pass/Fail)		
After the humidity test the specimens should be subjected to the function test at ambient temperature.	The smoke signal should no manner dangerous to perso during the entire smoke em	Smoke emission time (min/sec)			
	The colour of the smoke should 34, 48, 49 or 50 of the publication Dictionary of Names. *		Smoke emission q	uality (Continuous/I	ntermittent)
	*Special Publication 440, Na Washington, DC 20402, USA.	ational Bureau of Standards,	Smoke emission colour: (Passed/Failed)		
			Comments/Observ	vations	
			Passed	Failed	

1 age 30			
	Manufacturer:	Date:	Time:
Lifebuoy Self Activating Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.3.7.1 1 m immersion for 24 hours test		Regulations: LSA Code I/1.2.2 ar	nd II/2.1.3; MSC.81	1(70) 1/4.3.1	
Test Procedure	Acceptance Criteria		S	Significant Test Data	
Three specimens of smoke signal should be immersed horizontally for 24 h under 1 m of					
water.	properties.	ssolution of change of mechanical	13	14	15
After this test the specimens should be subjected to the function test at ambient temperature.	The signals should establish that it can be operated effectively without injury to the operator, or any person in close proximity, during firing or burning.		Condition after Co	onditioning (Pass/Fa	il)
	dangerous to persons close by, nor emit any flame during the entire smoke emission time. They should emit smoke of a highly visible colour at a uniform rate for a period of not less than 15 minutes		Smoke emission ti	ime (min/sec)	
			Smoke emission q	uality (Continuous/Ir	ntermittent)
	The colour of the smoke should be orange as defined by sections 34, 48, 49 or 50 of the publication Colour: Universal Language and				
	Dictionary of Names. *	Colour. Oniversal Language and	Smoke emission colour: Passed/Failed		
		National Bureau of Standards,			
	Washington, DC 20402, USA.		Comments/Observ	vations	
			Passed	Failed	

Passed _____ Failed _____

Man	ufacturer:	Date:		Time:	
Lifebuoy Self Activating Smoke Signals Mod	el:	Surveyor:			
Lot/S	Serial Number:	Organization:			
2.1.3.7.2 Salt Spray Conditioning		Regulations: LSA Code I/1.2.2 &	& II/2.1.3; MSC.81	(70) 1/4.4.2	
Test Procedure	Acceptance	ce Criteria	,	Significant Test Data	ı
Three specimens of smoke signals should be subjected to a salt spray (5% natrium chloride	The three specimens should sho shrinking, cracking, swelling, dis		Specimen No		
solution) at a temperature of +35±3°C for at least 100 h.	properties.	solution of change of mechanical	16	17	18
The three signals should be activated at ambient	The signals should establish that it can be operated effectively without injury to the operator, or any person in close proximity,		Condition after Co	onditioning (Pass/Fa	il)
temperature in accordance with the manufacturer's operating instructions.	during firing or burning. The specimen signal should not i dangerous to persons close by, not	r emit any flame during the entire	Smoke emission ti	ime (min/sec)	
	smoke emission time. They should emit smoke of a highly visible colour at a uniform rate for a period of not less than 15 minutes when floating in calm water.				
	The colour of the smoke should	be orange as defined by sections	Smoke emission quality (Continuous/Intermittent)		
	34, 48, 49 or 50 of the publication	Colour: Universal Language and			
	Dictionary of Names. *		Smoke emission c	olour: Passed/Failed	
	*Special Publication 440, No Washington, DC 20402, USA.	ational Bureau of Standards,			
	washington, DC 20402, USA.		Comments/Observ	vations	

1 age 32			
	Manufacturer:	Date:	Time:
Lifebuoy Self Activating Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.3.8 Heptane test	ne test Regulations: LSA Code I/1.2.2 &		& II/2.1.3.1; MSC.8	1(70) 1/4.8.2	
Test Procedure	Acceptance Criteria		Significant Test Data		a
Three smoke signals should function in water covered by 2 mm layer of heptane floating on a	The three specimens should not ignite the heptane.		Specimen No		
layer of water. The smoke signal should be		ignite explosively or in a manner	19	20	21
allowed to burn completely.	smoke emission time.	r emit any flame during the entire	Heptane ignition ((Passed/Failed)	
	The colour of the smoke should be orange as defined by sections 34, 48, 49 or 50 of the publication Colour: Universal Language and Dictionary of Names. * *Special Publication 440, National Bureau of Standards, Washington, DC 20402, USA.		Smoke emission ti	me (min/sec)	
			Smoke emission q	uality (Continuous/	Intermittent)
			Smoke emission co	olour: (Passed/Faile	rd)
			Comments/Observ	rations	
			Passed	Failed	

	Manufacturer:	Date:	Time:
Lifebuoy Self Activating Smoke Signals	Model:	_ Surveyor:	
	Lot/Serial Number:	Organization:	
	Lot/Serial Number:	Organization:	

2.1.3.9 Laboratory smoke obscuration te	est	Regulations: LSA Code I/1.2.2 &	2.2 & II/2.1.3; MSC.81(70) 1/4.8.3	
Test Procedure	Acceptance Criteria		Significant Test Data	
Laboratory testing of the smoke signal should establish that at least 70% obscuration throughout the minimum emission time is attained when the smoke is drawn through a 19 cm diameter duct by a fan capable of producing an entrance airflow of 18.4 m³/min.	The testing laboratory report shobscuration rate throughout the mis maintained and meets the requirements.	ninimum emission time of 15 min	Laboratory Testing Report No. Report acceptable (Yes/No) Smoke obscuration rate achieved at -30°C	sec % sec _%

1 480 5 .			
	Manufacturer:	Date:	Time:
Lifebuoy Self Activating Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.3.10 Wave test		Regulations: LSA Code I/1.2.2 &	& II/2.1.3; MSC.81(70) 1/1.9.5
Test Procedure	Acceptano	ce Criteria	Significant Test Data
	The specimen should function eff The smoke signal should not ig dangerous to persons close by, no smoke emission time. It should emit smoke of a highly of a period of not less than 15 minu least 300 mm high. The colour of the smoke should 34, 48, 49 or 50 of the publication Dictionary of Names. *	ce Criteria	, , ,
			PassedFailed

	Manufacturer:	Date:	Time:
Lifebuoy Self Activating Smoke Signals	Model:	_ Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.3.11 Attachment fitting strength test		Regulations: LSA Code I/1.2.2, l	II/2.1.3 & II/2.1.1.6; MSC.81(70) 1/10.2.8
Test Procedure	Acceptance Criteria		Significant Test Data
A force of 225 N should be applied to the fitting that attaches the smoke signal to the lifebuoy. The test is to be carried out at temperatures of -30°C and +65°C.	The smoke signal or the fitting shot the test.		-
			Passed Failed

1 450 50			
	Manufacturer:	Date:	Time:
Lifebuoy Self Activating Smoke Signals	Model:	_ Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.3.12 Safety inspection		Regulations: LSA Code I/1.2.2	
Test Procedure	Acceptance	e Criteria	Significant Test Data
It should be established by visual inspection that the self-activating smoke signal:			
1. is indelibly marked with clear and precise instructions on how it should be operated and mounted and that the danger end can be identified by day or night;	Clear and precise operating and n on the smoke signal.	nounting instructions are marked	Markings and identification of signal: - Passed Failed
2. does not depend on adhesive tapes or plastic envelopes for its water resistant properties; and	Adhesive tapes or plastic envelope resistant properties.	es are not used to maintain water-	Water resistant without the use of envelopes or adhesive tape.
3. can be indelibly marked with means of determining its age.	Date of manufacturing and date of outside.	of expiry indelible printed on the	Passed Failed Smoke signal indelible date stamped Passed Failed Comments/Observations

2.2 LIFEJACKETS AND ASSOCIATED EQUIPMENT

2.2.1 INHERENTLY BUOYANT LIFEJACKETS

EVALUATION AND TEST REPORT

2.2.1.1	Submitted drawings, reports and documents
2.2.1.2	Quality assurance
2.2.1.3	Visual inspection
2.2.1.4	General data and specification
2.2.1.5	Temperature cycling test
2.2.1.6	Buoyancy test
2.2.1.7	Fire test
2.2.1.8	Oil resistance test
2.2.1.9	Test for materials, cover, tapes and seams
2.2.1.10	Body or lifting loop strength test
2.2.1.11	Shoulder strength test
2.2.1.12	Additional tests for lifejacket material other than cork or kapok – Stability under temperature cycling
2.2.1.13	Additional tests for lifejacket material other than cork or kapok – Water absorption test
2.2.1.14	Donning test
2.2.1.15	Preparation for water performance tests
2.2.1.16	Water performance tests – Righting test
2.2.1.17	Water performance tests – Drop test
2.2.1.18	Swimming and water emergence test
2.2.1.19	Children's lifejacket - Test subjects selection
2.2.1.20	Children's lifejacket - Water performance tests - Righting test
2.2.1.21	Children's lifejacket - Water performance tests - Drop test
2.2.1.22	Children's lifejacket - Mobility test

2.2.1 INHERENTLY BUOYANT LIFEJACKETS

EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

						rage 39
		Manufacturer	:	Date:	Time:	
Inherently Buoyant Lifejackets		Model:		Surveyor:		
		Lot/Serial Nu	mber:			
2211 61 44						
2.2.1.1 Submitted	drawing	s, reports and d				
			Submitted drawing	gs and documents		Status
Drawing No.	Revisio	on No. & date		Title of drawing		
			Submitted report	s and documents		Status
Report/Document No.	Revisio	on No. & Date		Title of report / document		
			Maintenance Manual -			
			Operations Manual -			

	Manufacturer:	Date:	Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2.2.1.2 Quality Assurance		Regulations: -	
International Convention for the inspected, representatives of the A of manufacturers to ensure that the used comply with the specification. Manufacturers should be required that life-saving appliances are prosaving appliance approved by the	particular type are required by Chapter III of the Safety of Life at Sea, 1974, as amended, to be Administration should make random inspections e quality of life-saving appliances and materials a of the approved prototype life-saving appliance. to institute a quality control procedure to ensure evided to the same standard as the prototype lifence Administration and to keep records of any ordance with the Administration's instructions.	Quality Assurance Procedure: Quality Assurance Procedure: Quality Assurance Manual: Description of System. Quality Assurance System acceptable Yes. Comments/Observations	

			C
	Manufacturer:	_ Date:	_ Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.1.3 Visual Inspection Regulations: LSA Code I/1.2.2.1, 1.2.2.6, 1.2.2.7, 1.2.2.9 & 1.2.3				
Test Procedure	Acceptance Criteria		Significant Test Data	
	Inherently buoyant lifejackets should:			
1. Approval markings.	be clearly marked with approval information including the Administration which approved it, date of manufacturer and any operational restrictions		Passed	Failed
2. Retro-reflective tape	be fitted with approved patches of retro-reflective material with a total area of at least 400 cm ² according to IMO Res. 658(16). In the case of a reversible lifejacket, the arrangement should be complied with no matter which way the lifejacket is put on. Such material should be placed as high on the lifejacket as possible.		Passed	Failed
3. Lifejacket light	have provision to be fitted with a light		Passed	Failed
4. Donning and comfort	be so constructed that it is capable of capable of being worn in one way and, incorrectly. It should also be comfortable	as far as possible cannot be donned	Passed	Failed
5. Whistle	be fitted with a whistle firmly secured b	by a cord to the lifejacket.	Passed	Failed
6. Colour of lifejacket	be of highly visible colour		Passed	Failed
			Comments/Observations	

Manufacture		er:		Date:		Time:	
Inherently Buoyant Lifejackets	Model:		S	urveyor:			
	Lot/Serial N	lumber:		Organization:			
			T				
2.2.1.4 General Data and Sp	pecifications	ı	Regulatio	ons: LSA Code / MSC.81(70)			
Construction Material:		Additional equipment:			Donning instruct	ions:	
Fabric produced by:		Retro reflective material: -	□ YES	\square NO	□ YES	$\Box NO$	
Type:		Type:					
Buoyant material produced by:		Whistle : - Type:	□ YES	□NO			
Type:		Light (if fitted): Type:		□NO			
		Proper marking for children's lifejacket:	□ YES	□NO	Passed	Failed	

				Page 63
	Manufacture	er:	Date:	Time:
Inherently Buoyant Lifejackets	Model:		Surveyor:	
	Lot/Serial N	[umber:	Organization:	
2.2.1.5 Temperature cyclin	ng test		Regulations: LSA Code I/1.2.2.2	2; MSC.81(70) 1/2.1 and 2.7.7
Test Procedure		Acceptan	ce Criteria	Significant Test Data
A lifejacket should be subjectemperature cycling test of	surrounding	The lifejacket material should shrinking, swelling dissolution or	now no signs of damage such as changes of mechanical qualities	(See following page for test data)
temperatures of -30°C and +6 alternating cycles need not follow after each other and the followin repeated for a total of 10 cycles, is	immediately g procedure,			Passed Failed
 an 8 h cycle at +65°C to be of one day; and the specimens removed from chamber that same day and under ordinary room condition next day; an 8 h cycle at -30°C to be conext day; and the specimen removed from chamber that same day and under ordinary room condition next day; 	m the warm left exposed ons until the ompleted the m the cold left exposed			If not cork or kapok has the buoyant material been tested according to 2.2.1.12. □ YES □ NO Comments/Observations
The lifejacket should then be examined. If the buoyancy mate been subjected to the test 2.2.1.12, should also be examined internally.	erial has not the lifejacket			

1 48 0 0 1			
	Manufacturer:	_ Date:	Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.1.5 Temperature cycling test (Continued)		Regulations: LSA Code I/1.2.2.2; MSC.81(70) 1/2.1 and 2.7.7		
Test Procedure	Acceptance	e Criteria	Significant Test Data	
Four of the specimens should be used for water absorption tests, two of which should be so tested after they have also been subjected to the diesel oil test as prescribed in 2.2.1.8 The Specimen should be at least 300mm square and be of the same thickness as used in the lifejacket.	Acceptance	e Criteria	Comments/Observations Comments/Observations	

			C
	Manufacturer:	_ Date:	_ Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.1.5	Temperature cycling test – Test dat	a	Regulations: LSA Code I/1.2.2; MSC.81(70) 1	1/2.1
	I	HOT CYCLE		COLD CYCLE
Cycle 1	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration:hours	Date In: Time In : Temperature : 0 0	Date Out: Time Out: Duration : hours
Cycle 2	Date In: Time In : Temperature : C	Date Out: Time Out: Duration:hours	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 3	Date In: Time In : Temperature : C	Date Out: Time Out: Duration:hours	Time In :	Date Out: Time Out: hours
Cycle 4	Date In: Time In : Temperature : C	Date Out: Time Out: Duration:hours	Date In: Time In : Temperature : 0C	Date Out: Time Out: hours
Cycle 5	Date In: Time In : Temperature : C	Date Out: Time Out: Duration:hours	Date In: Time In : Temperature : 0C	Date Out: Time Out: Duration : hours
Cycle 6	Date In: Time In : Temperature : C	Date Out: Time Out: Duration:hours	Time In :	Date Out: Time Out: Duration : hours
Cycle 7	Date In: Time In : Temperature : C	Date Out: Time Out: Duration:hours	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 8	Date In: Time In : Temperature : C	Date Out: Time Out: Duration:hours	Time In :	Date Out: Time Out:hours
Cycle 9	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration:hours	Time In :	Date Out: Time Out: Duration : hours
Cycle 10	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration: hours	Date In:	Date Out: Time Out: Duration :hours

Tage 00	Manufacturer:	_ Date:	Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.1.6 Buoyancy test	Regulations: LSA Code II/2.2.1.	.7; MSC.81(70) 1/2.2	
Test Procedure	Acceptance Criteria	Significant Test Data	
The two lifejackets subjected to temperature cycling and the hot and cold inflation test should then be used for the buoyancy test. The buoyancy of the two lifejackets should be measured before and after 24 h complete submersion to just below the surface in fresh water. The test to be repeated as many times as necessary to perform the test once with each compartment in the uninflated condition.	The difference between the initial buoyancy and the final buoyancy should not exceed 5% of the initial buoyancy.	Buoyancy test method: Start (time): Temperature: Pressure: Finish (time): Temperature: Pressure: Pressure/Temperature corrections: Buoyancy 1 Buoyancy 2 % differencekg% Passed Failed Comments/Observations	

	Manufacture	er:	Date:	Time:		
Inherently Buoyant Lifejackets	Model:		Surveyor:			
	Lot/Serial N	lumber:	Organization:			
2.2.1.7 Fire test				A Code II/2.2.1.1; MSC.81(70) 1/2.3		
Test Procedure		Acceptano	ce Criteria	Significant Test Data		
A test pan 30x35x6cm should be essentially draught-free area. Wat put in the bottom of the test par minimum total depth of 1 cm enough petrol to make a minimum. The petrol should then be ignited to burn freely for 30 s. The lifej then be moved through the flame hanging position, with the bot lifejacket is 25 cm above the top expans of that the duration of expeflames is 2 s.	ter should be in to make a followed by dept of 4 cm. and allowed acket should its in an free-tom of the dge of the test	The lifejacket should not sustain being removed from the flames.	burning or continue melting after	Passed Failed Comments/Observations		
2.2.1.8 Oil resistance test		Regulations: LSA Code II/1.2.2		MSC.81(70) 1/2.4.1 & 2.4.2		
Test Procedure		Acceptance	ance Criteria Significant Test Data			
The lifejacket should be immersed for a period of 24 h under 100 diesel oil at normal room temperatu	mm head of		d show no signs of damage, such ng, dissolution or change of	Passed Failed Comments/Observations		

	Manufacturer:	Date:	Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.1.9 Tests for materials, cover, tapes and seams Regulations		ns: LSA Code I/1.2.2; MSC.81(70) 1/2.5		
Test Procedure	Acceptance Criteria		Significant Test Data	
The materials used for the cover, tapes, seams and additional equipment should be tested to establish that they are:	The results should be to the satisfithe Administration.	Tests: (Specify		
.1 rot - proof,			Tear strength as received (N) :N/AN/A	
.2 colour-fast and			.2 Resistance to rubbing, wet and dry – (ISO 105-X12 & 105-E02) Cycles:	
.3 resistant to deterioration from exposure to sunlight			.3 Tensile strength after weathering Weathering Method:	
and that they are not unduly affected by .4 seawater,			.4 Tensile strength after exposure to sea water. Method: Duration: (N/25 mm width) (% retained strength) (% retained strength)	
.5 oil or			.5 Tensile strength after exposure to oil. Type of oil: Duration: (N/25 mm width)	
.6 fungal attack			.6 Tensile strength after fungal attach. Type of oil: Duration: (N/25 mm width) (% retained strength) (% retained strength)	
			Acceptable: 1) \square Yes \square No 2) \square Yes \square No 3) \square Yes \square No 4) \square Yes \square No 5) \square Yes \square No 6) \square Yes \square No	

						1 age 0
	Manufacture	er:	Date:		Time:	
Inherently Buoyant Lifejackets	Model:		Surveyor:			
	Lot/Serial No	umber:	Organization:			
2.2.1.10 Body or lifting loop			Regulations: LSA Code I/1.2			
Test Procedure		Acceptano	ce Criteria		Significant Tes	st Data
The lifejacket should be immersed in water for a period of 2 min. It should then be removed from the water and closed in the same manner as when it is worn by a person. A force of not less than 3,200 N (2,400 N in the case of a child-size lifejacket) should be applied for 30 min to the part of the lifejacket that secures it to the body of the wearer (see figure 1) or to the lifting loop of the lifejacket.		The lifejacket should not be damaged as a result of this test			d:	Lifting loop ——————————————————————————————————
Vest-type lifejacket Yoke or over-the-life 1 C= Cylinder 125mm ad 50mm chi L= Test load	head type lifejacket			Test results Closure system: Lifting loop:		d Failed d Failed

Tage 70	Manufacturer:	_ Date:	Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.1.11 Shoulder strength test	Regulations: LSA Code I/1.2.2;		MSC.81(70) 1/2.6.2	
Test Procedure	Acceptance Criteria		Significant Test Data	
The lifejacket should be immersed in water for a period of 2 min. It should then be removed from the water and closed in the same manner as when it is worn by a person. A force of not less than 900 N (700 N in the case of a child-size lifejacket) should be applied for 30 min to the shoulder section of the lifejacket (see fig 2). Yest-type Melastet Fig 2 C= Cylinder 125mm adult sizes 50mm child sizes L= Test load	The lifejacket should not be dama	aged as a result of this test	Force applied: Shoulder tested: Test result: Passed Failed Comments/Observations	

					1 age / 1
	Manufacture	er:	Date:	Time:	
Inherently Buoyant Lifejackets	Model:		Surveyor:		
	Lot/Serial N	umber:	Organization:		
2.2.1.12 Additional tests for Stability under temporal		erial other than cork or kapok –	Regulations: LSA Code I/1.2.2; M	ISC.81(70) 1/2.7 – 2.7.4	
Test Procedure		Acceptanc	ce Criteria	Significant Test Data	ı
The following tests should be carried specimens of lifejacket buoyancy mate cork or kapok The Specimen should be at least 300r be of the same thickness as used in the specimen should be labelled and should be recorded prior to the test. ① Six specimens should be alternately h to surrounding temperatures of -3 C. These alternating cycles nee immediately after each other and procedure, repeated for 10 cycles, is .1 an 8 h cycle at +65°C to be compand .2 the specimens removed from the withat same day and left exposed under conditions until the next day; .3 an 8 h cycle at -30°C to be conday; and .4 the specimens removed from the that same day and left exposed under conditions until the next day. ② The dimensions of the specimens should be carefully examined. ③ Two of the specimens should be should be carefully examined. ④ Four of the specimens should be absorption tests, two of which should after they have also been subjected the test as prescribed in 2.2.1.8	mm square and lifejacket. The the dimension subjected for 8 10° C and +65° ed not follow the following acceptable: leted in one day warm chamber rordinary room impleted the next ne cold chamber er ordinary room all be recorded expecimens cut open and used for water all be so tested		ign of internal change of structure or	Dimensions prior to test Length Width Specimen No. 1 Specimen No. 2 Specimen No. 3 Specimen No. 5 Specimen No. 6 Dimensions after test Length Width Specimen No. 1 Specimen No. 2 Specimen No. 3 Specimen No. 4 Specimen No. 5 Specimen No. 5 Specimen No. 5 Specimen No. 5 Specimen No. 6 Passed Specimen No. 1 Specimen No. 6 Passed Failed Passed Passed Failed Passed Failed Passed Comments/Observations (See following page for test data)	Height Failed procedure used:

1 486 7 2			
	Manufacturer:	Date:	_ Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.1.12	Temperature cycling test – Test data		Regulations: LSA Code I/1.2.2; MSC.81(70) 1/2.	1
	HO	OT CYCLE		COLD CYCLE
Cycle 1	Date In: Time In : Temperature : C	Date Out:	Date In: Time In : Temperature : OC	Date Out: Time Out:hours
Cycle 2	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 3	Date In: Time In : Temperature :^0C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration : hours
Cycle 4	Date In: Time In : Temperature : C	Date Out:	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 5	Date In: Time In : Temperature : C	Date Out:	Date In: Time In : Temperature : OC	Date Out: Time Out: hours
Cycle 6	Date In: Time In : Temperature : C	Date Out: Time Out:hours	Time In :	Date Out: Time Out: Duration : hours
Cycle 7	Date In: Time In : Temperature : C	Date Out: Time Out:hours	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 8	Date In: Time In : Temperature : C	Date Out: Time Out:hours	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 9	Date In: Time In : Temperature : OC	Date Out: Time Out:hours	Time In :	Date Out: Time Out: Duration : hours
Cycle 10	Date In: Time In : Temperature : OC	Date Out:	Date In:	Date Out: Time Out: hours

Manufacturer: Date: Time;					1 age 7
2.2.1.13 Additional tests for lifejacket material other than cork or kapok - Regulations: LSA Code l/1.2.2; MSC.81(70) 1/2.7.5 - 2.7.8 Water absorption test Test Procedure Acceptance Criteria The following tests should be carried out on six specimens of lifejacket buoyancy materials other than cork or kapok. The tests should be carried out in fresh water and the specimens should be immersed for a period of seven days under a 1.25 m head of water. The specimens should be at least 300 mm square and be of the same thickness as used in the lifejacket. Alternatively, the entire lifejacket Alternatively, the entire lifejacket and the specimens should be recorded at the beginning and end of these tests. The tests should be carried out: 1 on two specimens as supplied; 2 on two specimens which have been subjected to the temperature cycling as prescribed in 2.2.1.12; and 3 on two specimens which have been subjected to the temperature cycling as prescribed in 2.2.1.12 followed by the diesel oil test as prescribed in 2.2.1.8.		Manufactur	er:	Date:	Time:
Test Procedure	Inherently Buoyant Lifejackets	Model:		Surveyor:	
Test Procedure		Lot/Serial N	lumber:	Organization:	
The following tests should be carried out on six specimens of lifejacket buoyancy materials other than cork or kapok. The tests should be carried out in fresh water and the specimens should be immersed for a period of seven days under a 1.25 m head of water. The specimens should be at least 300 mm square and be of the same thickness as used in left lifejacket may be subjected to the test. The dimensions should be carried out: 1 on two specimens as supplied; 2 on two specimens which have been subjected to the temperature cycling as prescribed in 2.2.1.12; and 3 on two specimens which have been subjected to the temperature cycling as prescribed in 2.2.1.12 followed by the diesel oil test as prescribed in 2.2.1.8. The specimens should state the mass in kilograms, which each specimen and seven days immersion. The results should not exceed 16% for specimens should he earned out of the water after one and seven days immersion. The results should not exceed 16% for specimens should he earned out the diesel oil conditioning and should not exceed 5% for all specimens. The tests should be carried out: 1 on two specimens which have been subjected to the temperature cycling as prescribed in 2.2.1.12; and 3 on two specimens which have been subjected to the temperature cycling as prescribed in 2.2.1.12 followed by the diesel oil test as prescribed in 2.2.1.8.		lifejacket mat			
specimens of lifejacket buoyancy materials other than cork or kapok. The tests should be carried out in fresh water and the specimens should be immersed for a period of seven days under a 1.25 m head of water. The specimens should be at least 300 mm square and be of the same thickness as used in the lifejacket. Alternatively, the entire lifejacket may be subjected to the test. The dimensions should be carried out: The tests should be carried out: 1 on two specimens as supplied; 2 on two specimens which have been subjected to the temperature cycling as prescribed in 2.2.1.12; and 3 on two specimens which have been subjected to the temperature cycling as prescribed in 2.2.1.12 followed by the diesel oil test as prescribed in 2.2.1.12. followed by the diesel oil test as prescribed in 2.2.1.12. followed by the diesel oil test as prescribed in 2.2.1.12. followed by the diesel oil test as prescribed in 2.2.1.13.	Test Procedure		Acceptano	ce Criteria	Significant Test Data
Passed Failed Comments/Observations	specimens of lifejacket buoyand other than cork or kapok. The tercarried out in fresh water and the should be immersed for a period of under a 1.25 m head of water. The specimens should be at less quare and be of the same thicknet the lifejacket. Alternatively, the en may be subjected to the test. The should be recorded at the beginning these tests. The tests should be carried out: 1 on two specimens as supplied. 2 on two specimens which subjected to the temperature prescribed in 2.2.1.12; and 3 on two specimens which subjected to the temperature prescribed in 2.2.1.12 follows.	ey materials sts should be ne specimens of seven days ast 300 mm ss as used in tire lifejacket e dimensions ng and end of ed; have been re cycling as owed by the	cracking, swelling, dissolution or The results should state the respecimen could support out of the immersion. The reduction of buoyancy should which have been exposed to the control of the control o	change of mechanical qualities. nass in kilograms, which each e water after one and seven days ld not exceed 16% for specimens	After 1 day After 7 days %diff. Specimen No. 1 kg kg % Passed Failed Specimen No. 2 kg kg % Passed Failed Test results: (Specimens subjected to temperature Cycling test.) Specimen No. 3 kg kg % Passed Failed Specimen No. 4 kg kg % Failed Test results: (Specimens subject to temperature cycling and oil exposure) Specimen No. 5 kg kg % Passed Failed Specimen No. 6 kg kg % Passed Failed

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	Manufacturer:	_ Date:	Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.1.14 Donning Test	Regulations: LSA Code II/2.2.1.2 –	2.2.1.4; MSC.81(70) 1/2.8.1 to 2.8.5.2
Test Procedure	Acceptance Criteria	Significant Test Data
As lifejackets will be used by uninitiated persons, often in adverse conditions, it is essential that risk of incorrect donning be minimised. The test should be carried out with at least six ablebodied persons of the following heights and weights: Height Weight 1.40m - 1.60m; 1 person under 60kg	Ties and fastenings necessary for proper performance should be few and simple. Lifejackets should readily fit various sizes of adults, both lightly and heavily clad. Lifejackets should be capable of being worn inside-out, or clearly in only one way. At least 75% of the test subjects who are completely unfamiliar with the lifejacket should be able to done it within 1 min without assistance, guidance or prior demonstration. After demonstration, the test subjects should correctly don lifejackets within a period of 1 min without assistance.	Male/Female Height Weight Subject No.1 Subject No.2 Subject No.4 Subject No.5 Subject No.6 Donning time without guidance Time Passed Failed Subject No. 1 Subject No. 2 Subject No. 3 Subject No. 5 Subject No. 1 Subject No. 1 Subject No. 1 Subject No. 2 Subject No. 1 Subject No. 2 Subject No. 3 Subject No. 1 Subject No. 3 Subject No. 4 Subject No. 5 Subject No. 4 Subject No. 5 Subject No. 5 Subject No. 1 Subject No. 5 Subject No. 1 Subject No. 1 Subject No. 2 Subject No. 3 Subject No. 3 Subject No. 3 Subject No. 5 Subject No. 5 Subject No. 5 Subject No. 6 Donning time with heavy weather clothing Time Passed Failed Subject No. 1 Subject No. 5 Subject No. 6 Donning time with heavy weather clothing Time Passed Failed Subject No. 1 Subject No. 5 Subject No. 1 Subject No. 1 Subject No. 5

			1 480 7 5
	Manufacturer:	_ Date:	_ Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.1.15 Preparation for water performance tests	Regulations: LSA C	Code II/2.2.1.2.5 & 2.2.1.3 – 2.2.1.4; MSC.81(70) 1/2.9 to 2.9.3
Test Procedure	Acceptance Criteria	Significant Test Data
This portion of the test is intended to determine the ability of the lifejacket to assist a helpless person or one in an exhausted or unconscious state and to show that the lifejacket does not unduly restrict movement. All tests should be carried out in fresh water under still conditions. The test subjects should wear only swimming costumes. These tests should be carried out with at least six persons as mentioned in paragraph 2.2.1.14. Each test subject should be made familiar with each of the tests in 2.2.16 and 2.2.17, particularly the requirements regarding relaxing		Test subjects same as in 2.2.14? If not, describe test subjects: Male/Female Height Weight Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Donning time Time Passed Failed Subject No. 2 Subject No. 3 Subject No. 3 Subject No. 4 Subject No. 5
and exhaling in the face-down position. The test subjects should don the lifejacket, unassisted, using only the instructions provided by the manufacturer. The observer should note ease and speed of donning, and proper fit and adjustment. Only good swimmers should be used, since the ability to relax in the water is rarely otherwise obtained.		Subject No. 6 Proper fit and adjustment Passed Failed Subject No. 1 Subject No. 2 Subject No. 3 Subject No. 4 Subject No. 5 Subject No. 6 Comments/Observations

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Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.1.16 Water performance tests – Righting test Regulations: LSA Code II/ 2.2.1.3.2; MSC 81(70)1/ 2.9.5 and 2.9.7 The test subject should swim at least three The test subject should come to rest with the mouth clear of the Turning 1 Turning 2 (Sec) water by at least 120 mm. The average of all subjects' trunk angles (Sec) gentle strokes (breaststroke) and then with Subject No.1 minimum headway relax, with head down and should be at least 30° back of vertical, and each individual subject's Subject No.2 the lungs partially filled, simulating a state of angle should be at least 20° back of vertical. The average of all Subject No.3 utter exhaustion. The test should be repeated subjects' faceplane (head) angles should be at least 40° above Subject No.4 horizontal, and each individual subject's angle should be at least after the test subj. has exhaled. Subject No.5 30° above horizontal. The mouth should be clear of the water in Subject No.6 not more than 5 sec. The lifejacket should not become dislodged or Record time from completion of last stroke until mouth comes clear of the water cause harm to the test subject. Freeboard Body angle Faceplane (mm) (deg) (deg) Subject No.1 The freeboard to the mouth, trunk angle and The Administration may, in exceptional circumstances, disregard Subject No.2 faceplane angle should be recorded after the test the results of a test on a subject if the results show a very slight Subject No.3 subject comes to rest deviation from the specified criteria, provided the Administration is Subject No.4 satisfied that the deviation can be attributed to the unusual size and Subject No.5 stature characteristics of the test subject and the results of tests on Subject No.6 other subjects show the satisfactory performance of the lifejacket. Slowest turn time: _____ sec Explain under comments/observations. Minimum individual freeboard mm Minimum individual trunk angle: Deg. Average trunk angles, all subjects: _____ Deg Minimum individual face plane (head) angle: _____ Deg Average faceplane (head) angle, all subjects: ______ Deg Did the lifeiacket become dislodged or cause harm to the test subject?: Did the light become detached or dislodged?: _ Is the position of the light in accordance with the LSA Code?: Is the retro reflective tape correctly fitted?: Failed

Comments/Observations

N	Manufacture	er:	Date:	Time:
Inherently Buoyant Lifejackets N	Model:		Surveyor:	
I	Lot/Serial N	fumber:	Organization:	
2.2.1.17 Water performance tests	ts – Drop te	est	Regulations: LSA Code II/	2.2.1.2.5; MSC 81(70)1/ 2.9.6
Test Procedure		Acceptance Cr	riteria	Significant Test Data
should jump vertically into the water, from a height of at least 4.5 m.	est subject e lifejacket jury.	The test subject should come to rest water by at least 120 mm. The average should be at least 30° back of vertical, angle should be at least 20° back of subjects' faceplane (head) angles sh horizontal, and each individual subject above horizontal. The mouth should more than 5 sec. The lifejacket shor cause harm to the test subject. The Administration may, in exceptionar results of a test on a subject if the deviation from the specified criteria, presatisfied that the deviation can be attrivature characteristics of the test subject other subjects show the satisfactory present the status of the test subjects.	e of all subjects' trunk angles and each individual subject's vertical. The average of all could be at least 40° above 's angle should be at least 30° be clear of the water in not all circumstances, disregard the expression results show a very slight rovided the Administration is abuted to the unusual size and ect and the results of tests on performance of the lifejacket.	(Sec) (mm) (Deg.) (Deg.) Subject No.1 Subject No.2 Subject No.3 Subject No.5 Subject No.6 Minimum individual freeboard mm Minimum individual trunk angle: Deg. Average trunk angles, all subjects: Deg Minimum individual face plane (head) angle: Deg

Tage 70	Manufacturer:	Date:	Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	_ Organization:	

2.2.1.18 Swimming and water emergence test		Regulations: LSA Code II/2.2.1	.4; MSC.81(70) 1/2.9.9
Test Procedure	Acceptanc	e Criteria	Significant Test Data
should attempt to swim 25 m and board a wi		ets who can accomplish the task to be able to perform it with the	Passed Failed Subject No.1 Subject No.2 Subject No.3 Subject No.5 Subject No.6 2) 25 m swim and boarding with lifejacket. Passed Failed Subject No.1 Subject No.1 Subject No.2 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Could at least two thirds of the subjects who could accomplish the task without a lifejacket also perform it with the lifejacket? Passed Failed Apparatus used: Comments/Observations

	Manufacturer:	_ Date:	_ Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.1.19 Children's lifejacket - Test subje	ets selection Regulations: LSA Code II/2.2.1	.5; MSC.81(70) 1/2.10.1 – 2.10.2	
Test Procedure	Acceptance Criteria	Significant Test Data	
As far as possible, similar tests (to the adult tests) should be applied for approval of lifejackets suitable for children Test subjects should be selected to fully represent the range of sizes for which the device is to be approved. Devices for smaller children should be tested on children as small as approximately 760mm tall and 9kg mass. At least six test subjects should be used for each 380mm and 16 kg of size range. Preparations for water performance tests. 1. Subjects should wear only swimming costumes. 2. As far as practical, only good swimmers who can relax in the water should be used. 3. The test subjects should be made familiar with each of the tests set out below and the requirement to relax and exhale while facedown. 4. All tests should be carried out in fresh water under still conditions.	The range of sizes for child-size lifejackets should be considered based on the test results. Devices should be sized by height or by height and weight.	Test subjects physical characteristics: 1) Height: 0,76m to 1,14m & Weight: 9kg to 25kg. Height Weight Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 2) Height: 1,14m to 1,52m & Weight: 25kg to 41kg. Height Weight Subject No.7 Subject No.8 Subject No.9 Subject No.10 Subject No.11 Subject No.12 3)Height: 1.52m to 1.90m & Weight: 41kg to 57kg. Height Weight Subject No.13 Subject No.14 Subject No.15 Subject No.16 Subject No.17 Subject No.18 Comments/Observations	

	Manufacturer:	Date:	Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2.2.1.20 Children's lifejacket	- Water performance tests – Righting test	Regulations: LSA Code II/ 2.2.1.5;	; MSC 81(70)1/ 2.10.2.1
The test subject should swim at gentle strokes (breaststroke) and minimum headway relax, with head the lungs partially filled, simulating utter exhaustion. The test should be after the test subject has exhaled. Record time from completion of until mouth comes clear of the water. The freeboard to the mouth, trunk faceplane angle should be recorded a subject comes to rest.	following requirements for the flotation stability characteristics. Turning time: Each individual su turn face-up in not more than 5 s. The combined results for clearar the water for all subjects should least 90 mm; each individual subtangle and 1270 mm and 23 kg should have	bject must bject must bject must nce above average at bject under at least 50 lal subject dhave at nk angles rtical, and be at least 50 subj.No.12 subj.No.13 subj.No.14 subj.No.15 subj.No.15 subj.No.15 subj.No.15 subj.No.15 subj.No.15 subj.No.15 subj.No.15 subj.No.15 subj.No.16 subj.No.17 subj.No.18 slowest turn time: Slowest turn time: Minimum freeboard subject Minimum freeboa	Turning time 2 Freeboard Trunk Angle Head angle degrees degrees

Minimum individual face plane (head) angle: ______ Deg
Average faceplane (head) angle, all subjects: ______ Deg

Meets all criteria for allowable range:

Allowable range in height and weight based on test data: ____m, ___ kg

Passed □ Failed □

Manut	cturer:		Date: Time:
Inherently Buoyant Lifejackets Model			Surveyor:
Lot/Se	ial Number:		Organization:
2.2.1.21 Children's lifejacket - Water p	rformance tests – Drop test	Regulat	llations: LSA Code II/2.2.1.5; MSC.81(70) 1/2.10.2.1
Test Procedure	Acceptance Criteria		Significant Test Data
Without readjusting the lifejacket, the subject should jump vertically into the w feet first, from a height of at least 4.5m. When jumping into the water, the test sul should be allowed to hold on to the lifejaduring water entry to avoid possible injury. The freeboard to the mouth, trunk angle, and faceplane angle should be recorded after the subject comes to rest. Note: Water tests using children should a causing distress or risk to the consideration should be taken of their age ability.	following requirements for their flotation stability characteristics. The combined results for clear above the water for all subjects average at least 90 mm; each incomplete subject under 1270 mm and should have at least 50 mm clear and each individual subject over mm and 23 kg should have at 1 mm clearance. The average of all subjects' trunk	earance should dividual 23 kg earance, er 1270 least 75 cangles wertical, ald be at acceptance ast 35° dividual	Subj.No.1 Subj.No.2 Subj.No.3 Subj.No.4 Subj.No.5 Subj.No.6 Subj.No.8 Subj.No.10 Subj.No.11 Subj.No.12 Subj.No.11 Subj.No.12 Subj.No.14 Subj.No.15 Subj.No.16 Subj.No.17 Subj.No.11 Subj.No.15 Subj.No.15 Subj.No.16 Subj.No.17 Subj.No.17 Subj.No.18 Subj.No.18

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	Manufacturer:	_ Date:	_ Time:
Inherently Buoyant Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.1.22 Children's lifejacket - Mobility te	ity test Regulations: LSA Code II/2.2.1.5; MSC.81(70) 1/2.10.2.5		
Test Procedure	Acceptance Criteria		Significant Test Data
To be considered in and out of the water.			Does the lifejacket provide for acceptable mobility of the test subjects both in and out of the water?
Mobility of the subject both in and out of the water should be given consideration in			YES ÿ NO ÿ
determining the acceptability of a device for approval.			Passed Failed
			Method of evaluation:
			Comments/Observations

2.2.2 INFLATABLE LIFEJACKETS (ADULTS & CHILD)

EVALUATION AND TEST REPORT

2.2.2.1	Submitted drawings, reports and documents		
2.2.2.2	Quality assurance		
2.2.2.3	Visual inspection		
2.2.2.4	General data and specification		
2.2.2.5	Temperature cycling test		
	2.2.2.5.1 Inflation system function2.2.2.5.2 Test data		
2.2.2.6	Buoyancy test		
2.2.2.7	Fire test		
2.2.2.8	Oil resistance test		
2.2.2.9	Test of materials for inflatable bladders, inflation systems and components 2.2.2.9.1 Coated fabrics test 2.2.2.9.2 Operating head load test 2.2.2.9.3 Pressure test 2.2.2.9.4 Compression test 2.2.2.9.5 Test of metallic components 2.2.2.9.6 Inadvertent inflation test		
2.2.2.10	Body or lifting loop strength test		
2.2.2.11	Shoulder strength test		
2.2.2.12	Donning test (uninflated situation)		
2.2.2.13	Donning test (inflated situation)		
2.2.2.14	Preparation for water performance test		
2.2.2.15	Water performance tests – Righting test		
2.2.2.16	Water performance tests – Drop test		
2.2.2.17	Swimming and water emergence test		
2.2.2.18	Children's lifejacket tests – test subjects		
2.2.2.19	Children's lifejacket tests Water performance Tests - Righting test		
2.2.2.20	Children's lifejacket tests Water performance Tests - Drop test		
2.2.2.21	Children's lifejacket mobility test		

2.2.2 INFLATABLE LIFEJACKETS (ADULTS & CHILD)

EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

	Manufacturer	: Date: Time:	
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Nu	mber: Organization:	
2.2.2.1 Submitted	l drawings, reports and d	locuments	
	Submitted drawings and documents		
Drawing No.	Revision No. & date	Title of drawing	
_			Т
		Submitted reports and documents	Status
Report/Document No.	Revision No. & date	Title of report / document	
		Maintenance Manual -	
		Operations Manual -	

1 age 00			
	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.2 Quality Assurance	Regulations: -
Except where all appliances of a particular type are required by Chapter III of the International Convention for the Safety of Life at Sea, 1974, as amended, to be inspected, representatives of the Administration should make random inspections of manufacturers to ensure that the quality of life-saving appliances and materials used comply with the specification of the approved prototype life-saving appliance. Manufacturers should be required to institute a quality control procedure to ensure that life-saving appliances are provided to the same standard as the prototype life-saving appliance approved by the Administration and to keep records of any production tests carried out in accordance with the Administration's instructions.	Quality Assurance Standard Used: - Quality Assurance Procedure: - Quality Assurance Manual: - Description of System. Quality Assurance System acceptable Yes/No Comments/Observations

	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.3	2.3 Visual Inspection Regulations: LSA Code I/1.2.2 & II/2.2				
	Test Procedure	Acceptanc	e Criteria	Significant Test Data	
		Inflatable lifejackets should:			
1.	Approval markings	be clearly marked with approval information which approved it, date of manufactures	rmation including the Administration rer and any operational restrictions	Passed	Failed
2.	Retro-reflective tape	be fitted with approved patches of retro-reflective material with a total area of at least $400~{\rm cm}^2$ according to IMO Res. $658(16)$. In the case of ϵ reversible lifejacket, the arrangement should be complied with no matter which way the lifejacket is put on. Such material should be placed as high on the lifejacket as possible.		Passed	Failed
3.	Lifejacket light	have provision to be fitted with a light	t.	Passed	Failed
4.	Donning and comfort	be so constructed that it is capable o capable of being worn in one way and incorrectly. It should also be comforta	l, as far as possible cannot be donned	Passed	Failed_
5.	Whistle	be fitted with a whistle firmly secured	by a cord to the lifejacket.	Passed	Failed
6.	Colour of lifejacket	be of highly visible colour		Passed	Failed
				Comments/Observations	

Tage 00	Manufactur	er:		Date:	Т	ime:	
Inflatable Lifejackets	Model:		S	urveyor:			
	Lot/Serial N	lumber:		Organization:			
2.2.2.4 General Data a	nd Specifications	Γ	Regulatio	ns: LSA Code II/2.2	; MSC.81(70)		
Construction Material:		Additional equipment:			Donning instructio	ons:	
Fabric produced by:		Retro reflective material: -	\square YES	\square NO	□ YES	$\Box NO$	
raone produced by.		Type:					
Type:		Whistle : -	□ YES	□NO			
		Type:					
Inflation system produced by:		Light (if fitted):	□ YES	\square NO			
Type:		Type:					
Cover fabric produced by:		Marked size range:					
Type:		Proper marking for children's		= NO		P. 1. 1	
Fabric for the inflatable ch Produced by:	amber	lifejacket:	□ YES	□NO	Passed	Failed	
Туре:							
Size and type of gas:							
Means of activating the inflation system:							

		Page 89
rer:	Date:	Time:
	Surveyor:	
Number:	Organization:	
	Regulations: LSA Code I/1.2.2.2	& 1.2.2.3; MSC.81(70) 1/2.11.1
Acceptan	nce Criteria	Significant Test Data
	Number:Acceptar	Surveyor:

Two inflatable lifejackets should be subjected Two uninflated Inflatable lifejackets after completion of the Examination to a temperature cycling test of surrounding temperature cycling should be examined externally. The lifejackets temperatures of -30° C and $+65^{\circ}$ C in the should show no signs of damage such as shrinking, cracking, 1. Lifejacket uninflated condition. These alternating cycles swelling dissolution or changes of mechanical qualities. Failed _ need not follow immediately after each other and the following procedure, repeated for a 2. Lifejacket total of 10 cycles, is acceptable: Failed _ 1. an 8 h cycle at $+65^{\circ}$ C to be completed in one day; and 3. Cold inflation test, auto inflation the specimens removed from the warm Temperature of water _____0C. chamber that same day and left exposed under ordinary room conditions until the Time to inflate and relief valves blowing _____ sec. next day; Auto inflation Passed_____Failed an 8 h cycle at -30°C to be completed the next day; and Cold inflation test, manual inflation the specimen removed from the cold Temperature of water _____⁰C. chamber that same day and left exposed under ordinary room conditions until the Time to inflate and relief valves blowing _____ sec next day; Manual inflation Passed_____Failed _____ Comments/Observations

1 age 90			
	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.5.1 Temperature cycling test - Inflation system function Regulations: LSA Code I/1.2.2.2			& 1.2.2.3; MSC.81(70) 1/2.11.1
Test Procedure	Acceptance Criteria		Significant Test Data
The automatic and manual inflation systems should each be tested immediately after each temperature cycling test as follows: 1. After the high temperature cycle the two inflatable lifejackets take from a stowage temperature of + 65°C, one should be activated using the automatic inflation system by placing it in seawater at a temperature of + 30°C and the other should be activated using the manual inflation system; and 2. After the low temperature cycle the two inflatable lifejackets take from a stowage temperature of -30°C, one should be activated using the automatic inflation system by placing it in seawater at a temperature of -1°C and the other should be activated using the manual inflation system.	The lifejackets should function satisfied. Temperature test data sheet on next	·	Hot inflation test, automatic inflation Temperature of water^0C. Time to inflate and relief valves blowing sec Automatic inflation PassedFailed Hot inflation test, manual inflation Temperature of water^0C. Time to inflate and relief valves blowing sec Manual inflation PassedFailed

			C
	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.5.2	Temperature cycling test – Test data		Regulations: LSA Code I/1.2.2.2 & 1.2.2.3; MS	SC.81(70) 1/2.11.1
	HO	OT CYCLE		COLD CYCLE
Cycle 1	Date In: Time In : Temperature : OC	Date Out:	Date In: Time In : Temperature : C	Date Out: Time Out: hours
Cycle 2	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : C	Date Out: Time Out: hours
Cycle 3	Date In: Time In : Temperature : 0 C	Date Out:	Time In :	Date Out: Time Out: Duration:hours
Cycle 4	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : OC	Date Out: Time Out: hours
Cycle 5	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : C	Date Out: Time Out: Duration : hours
Cycle 6	Date In: Time In : Temperature : OC	Date Out: Time Out:hours	Date In: Time In : Temperature : C	Date Out: Time Out: hours
Cycle 7	Date In: Time In : Temperature : 0 C	Date Out:	Date In: Time In : Temperature : OC	Date Out: Time Out:hours
Cycle 8	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Time In :	Date Out: Time Out: Duration:hours
Cycle 9	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0C	Date Out: Time Out:hours
Cycle 10	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : C	Date Out: Time Out: Duration :hours

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	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.6 Buoyancy test Regulations: LSA Code II/2.2.2			.3, 2.2.1.7; MSC.81(70) 1/2.2	
Test Procedure	Acceptance	ee Criteria	Significant Test Data	
The two lifejackets subjected to temperature cycling and the hot and cold inflation test should then be used for the buoyancy test. The buoyancy of the two lifejackets should be measured before and after 24 h complete submersion to just below the surface in fresh water. The test to be repeated as many times as necessary to perform the test once with each compartment in the uninflated condition. (The following equipment and procedure, or suitable alternatives may be used to carry out the buoyancy test of the lifejacket: 1. a mesh basket or tray large enough to contain the lifejacket and adequate weights to overcome the buoyancy of the	The difference between the initial should not exceed 5% of the initial. The chamber should be fitted with	buoyancy and the final buoyancy ll buoyancy.	1. Lifejacket No. 1 Weight of the mesh basket with the lifejacket:Kg Weight of the mesh basket without the lifejacket: Kg Buoyancy of front chamber at startKg. Buoyancy of front chamber at 24 hrKg. Difference in buoyancy < 5%Kg Buoyancy of back chamber at startKg. Buoyancy of back chamber at 24 hrKg. Difference in buoyancy < 5%Kg. PassedKg. Failed 2. Lifejacket No. 2. Weight of the mesh basket with the lifejacket:Kg	
 a tank of fresh water large enough to accommodate the basket or tray and the lifejacket with the uppermost part of the lifejacket 50 mm below the surface of the water; and a spring balance accurate to ± 0.015 kg. water temperature to be recorded at the start of each test and then after 24 hours on completion of each test.) 			Weight of the mesh basket without the lifejacket:Kg Buoyancy of front chamber at startKg Buoyancy of front chamber at 24 hrKg. Difference in buoyancy < 5%Kg Buoyancy of back chamber at startKg. Buoyancy of back chamber at 24 hrKg Difference in buoyancy < 5%Kg PassedFailed Comments/Observations	

			1 480 > 6
	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.7 Fire test	Regulations: LSA Code II/2.2.1.	.1; MSC.81(70) 1/2.3
Test Procedure	Acceptance Criteria	Significant Test Data
The chamber should be fitted with correct gas cylinder: The two inflatable lifejackets should be subjected to a fire test. A test pan 30 cm x 35 cm x 6 cm should be placed in an essentially draught-free area. Water should be put in the bottom of the test pan to a depth of 1 cm followed by enough petrol to make a minimum depth of 4 cm. The petrol should then be ignited and allowed to burn freely for 30 s. The two lifejackets, one inflated the other uninflated, should then be moved through the flames in an upright, forward, free-hanging position, with the bottom of the lifejacket 25 cm above the top edge of the test pan so that the duration of exposure to the flames is 2 s.	The two lifejackets should not sustain burning or continue melting after being removed from the flame. The inflated lifejacket should not deflate as a result of passing through the flames. The lifejacket should remain inflated after completing this test.	Size of pan x cm. 1. Lifejacket No. 1 Passed Failed 2. Lifejacket No. 2 Passed Failed Comments/Observations

ruge > 1			
	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.8 Oil resistance test		Regulations: LSA Code I/1.2.2.4	l; MSC.81(70) 1/2.4	
Test Procedure	Acceptano	ce Criteria	Significant Test Data	
Two of the inflatable lifejacket should be subjected to the oil resistance test. The lifejacket should be immersed horizontally for a period of 24 h under 100 mm head of diesel oil at normal room temperature.		ould be examined externally and ge such as shrinking, cracking, mechanical properties.	Condition of Lifejacket No.1 after 24 hours. Passed Failed Condition of Lifejacket No.2 after 24 hours. Passed Failed Comments/Observations	

				1 age 95
				ate: Time:
Inflatable Lifejackets	Model:		Sur	rveyor:
	Lot/Serial N	[umber:	Or	rganization:
2.2.2.9 Tests of n componen		e bladders, inflation systems &	Regulations	s: LSA Code I/1.2.2.1, 1.2.2.4 & 1.2.2.5; MSC.81(70) 1/2.11.4.1
Test Prod	cedure	Acceptance Criteria		Significant Test Data
The materials used for the additional equipment shou that they are:		The results should be to the satisf Administration.	action of the	Tests: (Specify
.1 rot – proof, acco Method 30:1981				.1 Tensile strength after microbial exposure Method: Duration: (N/25 mm width) (% retained strength)
.2 colour-fast; and				.2 Resistance to rubbing, wet and dry – (ISO 105-X12 & 105-E02) Cycles:
ISO 105-B04:198 and that they are not und	light, according to 88,			.3 Tensile strength after weathering Weathering Method: Duration: (N/25 mm width) (% retained strength)
.4 seawater; .5 oil; or				.4 Tensile strength after exposure to sea water. Method: Duration: (N/25 mm width)
,				.5 Tensile strength after exposure to oil. Type of oil: Duration: (N/25 mm width) (% retained strength)
.6 fungal attack				.6 Tensile strength after fungal attach. Type of oil: Duration: (N/25 mm width) (% retained strength)
				Acceptable: 1) □ Yes □ No 2) □ Yes □ No 3) □ Yes □ No 4) □ Yes □ No 5) □ Yes □ No 6) □ Yes □ No

1 age 90			
	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.9.1 Coated fabrics test Regulations: LSA Code I/1.2.2.1			, 1.2.2.4 & 1.2.2.5; MSC.81(70) 1/2.11.4.2.14	
Test Procedure	Acceptance	ce Criteria	Significant Test Data	
Coated fabrics used in the construction of inflatable buoyancy chambers should comply with the following requirements:-				
Coating adhesion should be tested in accordance with ISO 2411: 1991 using the method described at 5.1 at 100mm/min	(1) After being tested according adhesion should not be less than 5		1. Coating Adhesion (dry) - Test Results in the :- WarpN, WeftN Passed Failed	
2. coating adhesion should be tested when wet following ageing according to ISO 188 with an exposure of 336 ± 0.5 h in fresh water at (70.0 ± 1.0) °C following which the method at ISO 2411: 1991 paragraph 5.1 should be applied at 100mm/min.	(2) After being tested according when wet should not be less than a	to ISO 188, the coating adhesion 40 N per mm.	2. Coating Adhesion (wet) - Test Results in the :- WarpN, WeftN Passed Failed	
3. tear strength should be tested in accordance with ISO 4674: 1977 using method A1.	(3) After being tested according t tear strength should not be less that	*	3. Tear strength:N Passed Failed	
4. resistance to flex cracking should be tested in accordance with ISO 7854: 1984 method A using 9000 flex cycles.	(4) After being tested according to should be no visible cracking or do		4. Flexure Test:- Passed Failed	
			Comments/Observations	

				Page 9
	Manufactur	er:	Date:	Time:
Inf	flatable Lifejackets Model:		Surveyor:	
	Lot/Serial N	Number:	Organization:	
2.2	2.2.9.1 Coated fabric test (continued)		Regulations: LSA Code I/1.2.2.1	1, 1.2.2.4 & 1.2.2.5; MSC.81(70) 1/2.11.4.2.5 – 8
	Test Procedure	Acceptano	ce Criteria	Significant Test Data
5.	breaking strength should be tested in accordance with ISO 1421: 1977 using the CRE or CRT method, following conditioning for 24 ± 0.5 h at room temperature and should not be less than 200 N per 50 mm width.	strain should not be less than 200	to ISO 1421:1977, the breaking N per 50 mm width.	5. Break Strength (dry)N:- Passed Failed
6.	•	(6) After being tested according strain should not be less than 200	to ISO 1421:1977, the breaking N per 50 mm width.	6. Break Strength (wet)N: - Passed Failed 7. Elongation (dry) %: -
7.	elongation to break should be tested in accordance with ISO 1421: 1977 using the CRE or CRT method following conditioning at room temperature for 24 \pm 0.5 h.	(7) After being tested according temperature the elongation to brea	ng to ISO 1421:1977, in room ak should not exceed 60%.	Passed Failed 8. Elongation (wet) %: - Passed Failed
8.	elongation to break should be tested in accordance with ISO 1421: 1977 using the CRE or CRT method following conditioning immersed in fresh water at room temperature for 24 ± 0.5 h.		to ISO 1421:1977, in fresh water tion to break should not exceed	Comments/Observations

1 age 70			
	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.9.1 Coated fabric test (continued)			Regulations: LSA Code I/1.2.2.1, 1.2.2.1.4 & 1.2.2.1.5; MSC.81(70) 1/2.11.4.2.9 – 11		
	Test Procedure	Acceptano	ce Criteria	Significant Test Data	
9.	the resistance to exposure to light when tested in accordance with ISO 105-BO2: 1988.	(9) After being exposed to light w ISO 105 – B02:1988, the contrast exposed samples should not be less	between the unexposed and	9. Accelerated light test Class Passed Failed	
10.	the resistance to wet and dry rubbing when tested in accordance with ISO 105-X12: 1995.		bbed in accordance with ISO 105- bbed samples should not be less	10. Wet staining after rubbing Class Passed Failed	
11.	the resistance to seawater should not be less than class 4 in accordance with ISO 105 EO2: 1978.	(11) After being tested in accordachange in colour of the specimen	ance with ISO 105 EO2:1978, the should not less than class 4.	11. Dry staining after rubbing Class Passed Failed Comments/Observations	

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	Manufactur	er:	Date:	Time:
Inflatable Lifejackets	Model:		Surveyor:	
	Lot/Serial N	Jumber:	Organization:	
2.2.2.9.2 Operating head load	d test		Regulations: LSA Code I/1.2.2.	1, 1.2.2.1.4 & 1.2.2.1.5; MSC.81(70) 1/2.11.4.3
Test Procedure		Acceptano	ce Criteria	Significant Test Data
The operating head load test shou out using two lifejackets one life conditioned at -30°C for 8 hours at +65°C for 8 hours. After mou manikin or the test form the lifejact inflated, and a steady force of applied to the operating head as neat to the point where it enters the chamber. This load should be mai minutes during which the direction which it is applied should be varied.	ejacket to be and the other inting on the ket should be (220±10) N ar as possible he buoyancy intained for 5 and angle in	On completion of the test the lift should hold its pressure for 30 mi	rejacket should remain intact and nutes.	1. Security of operating head -30°C(Jacket 1) Load applied N. 2. Visible damage Passed Failed 3. Security of operating head +65°C (Jacket 2) Load applied N. 4. Visible damage Passed Failed 5. Pressure at the beginning of the test at -30°C and after 30 min. Jacket 1 at the beginning

1 agc 100			
	Manufacturer:	Date:	
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.9.3 Pressure test (1) Regulations: LSA Code II/2.2.2.		2.2.2; MSC.81(70) 1/2.11.4.4.12
Test Procedure	Acceptance Criteria	Significant Test Data
The inflatable buoyancy chambers should be capable of withstanding an internal over pressure at ambient temperature. All chambers of a lifejacket should be inflated using the manual method of inflation, after inflation the relief valves should be disabled and a fully charged gas cylinder according to the manufacturers recommendation should be fitted to the same inflation device and fired. All fully charged gas cylinders used in this test should be sized according to the markings on lifejacket.	Acceptance Criteria The lifejacket should remain intact and should hold its pressure and an anomalous. The lifejackets should no signs of damage such as cracking swelling or changes of mechanical qualities and that there has been on significant damage to the lifejacket inflation component.	1. Double charge test. Size of gas bottle grams. Duration of test min. 2. Chamber 1 - Pressure at the beginning of the test and after 30 min. at the beginning after 30 min 3. Chamber 2 - Pressure at the beginning of the test and after 30 min. at the beginning after 30 min 4. Chambers 3- Pressure at the beginning of the test and after 30 min. at the beginning after 30 min. at the beginning after 30 min 5. Chamber 4 - Pressure at the beginning of the
		test and after 30 min. at the beginning after 30 min 6. Damage to lifejacket Passed Failed Comments/Observations

				1 age 101
	Manufacture	er:	Date:	Time:
Inflatable Lifejackets	Model:		Surveyor:	·
	Lot/Serial N	(umber:	Organization:	
2.2.2.9.3 Pressure test (2)			Regulations: LSA Code; MSC.	81(70) 1/2.11.4.2
Test Procedure		Acceptano	ce Criteria	Significant Test Data
With one buoyancy chamber is operating head on the opposite chamber should be fired manually, charged gas cylinder according manufacturers recommendations operation of the relief valves should ensure that the excess pressure is resulted.	e buoyancy using a fully ng to the s. The d be noted to	The lifejacket should remain intages 30 minutes. The lifejackets should no signs swelling or changes of mechanica no significant damage to the lifejackets.	d qualities and that there has been	1. Chamber 1 Size of gas bottle grams. Pressure at the beginning of the test and after 30 min at the beginning after 30 min. 2. Relief valve operation. Passed Failed 3. Damage to lifejacket Passed Failed 4. Chamber 2 Size of gas bottle grams. Pressure at the beginning of the test and after 30 min at the beginning after 30 min. 5. Relief valve operation. Passed Failed 6. Damage to lifejacket Passed Failed Comments/Observations

1 age 102			
	Manufacturer:	_ Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.9.3 Pressure test (2) Cont.	Regulations: LSA Code; MSC.		81(70) 1/2.11.4.2
Test Procedure	Acceptance	ce Criteria	Significant Test Data
			7. Chamber 3 Size of gas bottle grams. Pressure at the beginning of the test and after 30 min. at the beginning after 30 min. 8. Relief valve operation. Passed Failed 9. Damage to lifejacket Passed Failed 10. Chamber 4 Size of gas bottle grams. Pressure at the beginning of the test and after 30 min. at the beginning after 30 min. 11. Relief valve operation. Passed Failed 12. Damage to lifejacket Passed Failed Pressure after the test in each camber:

	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2 2 2 0 3 Prossure test (3)		Regulations: I SA Code: MSC 81(70) 1/2 11	443

2.2.2.9.3 Pressure test (3) Regulations: LSA Code; MSC.81(70) 1/2.11.4.4.3	
Test Procedure	Acceptance Criteria		Significant Test Data
Air retention test	After 12 h the drop in pressure should not be greater than 10%.		1. Air retention test Chamber 1: Passed Failed
One inflation chamber of a lifejacket is filled with air until air escapes from the over-pressure valve or, if the lifejacket does not have an over-pressure valve, until its design pressure, as stated in the plans and specifications, is reached. This test is then repeated			2. Pressure at the beginning of the test and after 12 h. at the beginning after 12 h drop
as many times as necessary to test a different chamber until each chamber has been tested in this manner.			1. Air retention test Chamber 2: Passed Failed
The pressure release valve should be settled when the measurement starts.			2. Pressure at the beginning of the test and after 12 h. at the beginning after 12 h multiple with the desiration of the test and after 12 h. at the beginning after 12 h drop
			1. Air retention test Chamber 3: Passed Failed
			2. Pressure at the beginning of the test and after 12 h. at the beginning after 12 h drop
			1. Air retention test Chamber 4: Passed Failed
			2. Pressure at the beginning of the test and after 12 h. at the beginning after 12 h drop
			Comments/Observations

1 age 104			
	Manufacturer:	Date:	_ Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.9.4 Compression test	Regulations: LSA Code; MSC.		81(70) ½.11.4.5
Test Procedure	Acceptance Criteria		Significant Test Data
The inflatable lifejacket, packed in the normal manner should be laid on a table. A bag containing 75 kg of sand and having a base of 320 mm diameter should be lowered onto the lifejacket from a height of 150 mm in a time of 1 s. This should be repeat ten times, after which the bag should remain on the jacket for not less than 3 hours.	The lifejacket should be inflated by immersion into water and should inflate fully, the jacket to be inspected to ensure that no swelling or change of mechanical properties has occurred, the jacket should be checked for leaks		Weight of sand bag Kg. Area of Sand bag mm Drop Height mm Drop Time sec No. of Drops Length of test hr. Passed Failed Comments/Observations
2.2.2.9.5 Test of metallic components	Regulations: LSA Code; MSC.		81(70) 1/2.11.4.6
Test Procedure	Acceptance Criteria		Significant Test Data
Metal parts and components of a lifejacket should be corrosion resistant to seawater and should be tested in accordance with ISO 9227:1990 for a period of 96 h. Metal components should not affect a magnetic compass of a type used in small boats by more than 1 degree, when placed at a distance of 500 mm from it.	The metal components should be inspected and should not be significantly affected by corrosion, or effect any other parts of the lifejacket and should not impair the performance of the lifejacket. The lifejacket should not effect the magnetic compass by more than 1 ⁰ .		1. Corrosion Test on Components. Passed Failed 2. Magnetic Test on Components. Passed Failed Comments/Observations

	Manufacturer:	_ Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.9.6 Inadvertent inflation test	Regulations: LSA Code; MSC.81(70) 1/2.11.4.7	
Test Procedure	Acceptance Criteria	Significant Test Data
The resistance of an automatic inflation device to inadvertent operation should be assessed by exposing the entire lifejacket to sprays of water for fixed period.		Inadvertent Inflation. Passed Failed
The lifejacket should be fitted correctly to a free standing manikin of adult size, with a minimum shoulder height of 1500 mm. The lifejacket should be deployed in the mode in which it is worn ready for use but not deployed as used in the water (i.e. if it is equipped with a cover which is normally worn closed, then the cover should be closed for the test). Two sprays should be installed so as to spray fresh water onto the lifejacket, as shown in the diagram. One should be positioned 500 mm above the highest point of the lifejacket, and at an angle of 150 from the vertical centre line of		2. Auto inflation test. Auto inflation system operable. Passed Failed Comments/Observations
the manikin and the bottom line of the lifejacket. The other nozzle should be installed horizontally at a distance of 500 mm from the bottom line of the lifejacket, and points directly at the lifejacket. These nozzles should have a spray cone of 30° , each orifice being 1.5 ± 0.1 mm in diameter, and the total area of the orifice should be 50 ± 5 mm², the orifice being evenly spread over the spray nozzle area. The air temperature should be 20° C, and water should be supplied to the sprays at a pressure of 0.3 kPa - 0.4 kPa, a flow of 600 l/h, and at a temperature of 18° C to 20° C.		

Manufacture	r: Date:	Time:
Inflatable Lifejackets Model:	Surveyor:	
Lot/Serial No	ımber: Organization:	
2.2.2.9.6 Inadvertent inflation test (continu	ed) Regulations: LSA Code; MSC	5.81(70) 1/2.11.4.7
Test Procedure	Acceptance Criteria	Significant Test Data
The sprays should be turned on, and the lifejacket exposed to the following series of test to access the ability of the jacket to resist inadvertent inflation:	The lifejacket should not inflate during the test	1. Inadvertent Inflation.
5 minutes with the high spray on the front of the lifejacket;5 minutes with the high spray on the left side	After completing this test the lifejacket should be immersed in water to verify that the auto-inflation system is working.	Passed Failed 2. Auto inflation test.
of the lifejacket; 3) 5 minutes with the high spray on the back of the lifejacket; and		Auto inflation system operable. Time to inflate: sec.
.4) 5 minutes with the high spray on the right side of the lifejacket.		Passed Failed
During exposures .1), .2) and .4) the horizontal spray should be applied for 10 periods of 3 sec each to the front, left or right sides (but not back) as with the high spray. Test set-up for test of automatic inflation system	Alternative former	Comments/Observations Passed Failed

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	Manufactur	er:	Date:		Time:		
Inflatable Lifejackets	Model:		Surveyor:				
	Lot/Serial N	Jumber:	Organization:				
2.2.2.10 Body or lifting	loop strength test		Regulations: LSA Code; MSC	.81(70) 1/2.6.1			
Test Procedur	re	Acceptan	ce Criteria		Significant Test	t Data	
The lifejacket should be imme		The lifejacket or lifting loop should r	not be damaged as a result of this test.		Body strap	Lifting	g loop
a period of 2 min. It should				Force applied:			
from the water and closed in as when it is worn by a person				Time:			
less than 3,200 N (2,400 N				Slippage: Closure(s) tested			
child-size lifejacket) should b				Closure(s) tested	•		
min to the part of the lifejacke							
the body of the wearer (see fi the lifting loop of the lifejacke				Illustration of lif	fejacket lifting lo	oop test a	arrangement if
ine inting 100p of the inejacke				tested:			
	\frac{1}{2}			Test results			
Vest-type lifejacket Yoke or over-	-the-head type lifejacket			Closure system:	Passed	l	Failed
				Lifting loop:	Passed	1	Failed
Body strength test arrangemen	nt for lifejackets						

L - Test load

C - Cylinder 125 mm for adult sizes

50 mm for child-sizes

1 agc 100			
	Manufacturer:	_ Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.11 Shoulder strength test		Regulations: LSA Code; MSC.	SC.81(70) 1/2.6.2		
Test Procedure	Acceptano	ce Criteria	Significant Test Data		
One inflatable lifejacket subjected to the tests in 2.2.2.5, 2.2.2.6, 2.2.2.7, 2.2.2.8 and 2.2.2.10 above should be subjected to the shoulder strength test. The lifejacket should be immersed in water for a period of 2 min. It should then be removed from the water and closed in the same manner as when it is worn by a person. A force of not less than 900 N (700 N in the case of a child-size lifejacket) should be applied for 30 min to the shoulder section of the lifejacket. (see figure below). Shoulder strength test arrangement for lifejackets C - Cylinder 125 mm for adult sizes 50 mm for child-sizes L - Test load		as a result of this test.	Force appliedN Time force appliedmin Sign of damage Passed Failed Comments/Observations		

			1 480 100
	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.12 Donning test (Uninflated situation	Regulations: LSA Code II/2.2.1	.2.; MSC.81(70) 1/2.8.2.
Test Procedure	Acceptance Criteria	Significant Test Data
The test should be carried out with at least six able-bodied persons of the following heights and weights: Height Weight 1.40m - 1.60m; 1 person under 60kg 1 person over 60kg 1.60m - 1.80m 1 person under 70kg 1 person over 70kg	Ties and fastenings necessary for proper performance should be few and simple. Lifejackets should readily fit various sizes of adults, both lightly and heavily clad. Lifejackets should be capable of being worn inside-out, or clearly in only one way. At least 75% of the test subjects who are completely unfamiliar with the lifejacket should be able to done it within 1 min without assistance, guidance or prior demonstration.	Male/Female Height Weight Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6
The test should be repeated with the test subject wearing heavy-weather clothing. The observer should note: 1 ease and speed of donning; 2 proper fit and adjustment; and 3 that the lifejacket has been put on correctly.	After demonstration, the test subjects should correctly don lifejackets within a period of 1 min without assistance.	Time Passed Failed

1 age 110	Manufacturer:	_ Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.13 Donning test (Inflated situation) Regulations: LSA		Regulations: LSA Code II/2.2.1.2;	MSC.81(70) 1/2.8.2		
Test Procedure	Acceptance Criteria		Significant	Test Data	
Each test subject should be tested wearing normal clothing. The test should be carried out in inflated condition. The test should be repeated with the test subject wearing heavy-weather clothing. The observer should note: 1 ease and speed of donning; 2 proper fit and adjustment; and 3 that the lifejacket has been put on correctly.	simple. Lifejackets should readily fit and heavily clad. Lifejackets should or clearly in only one way.	be capable of being worn inside-out, o are completely unfamiliar with the it within 1 min without assistance, should correctly don lifejackets	Are test subjects same as for 2.2 Donning time with normal clothin Time Subject No.1 sec Subject No.2 sec Subject No.3 sec Subject No.4 sec Subject No.6 sec Subject No.6 sec Proper fit and adjustment Time Subject No.1 sec Subject No.2 sec Subject No.3 sec Subject No.4 sec Subject No.5 sec Subject No.6 sec Subject No.6 sec Subject No.6 sec Subject No.1 sec Subject No.5 sec Subject No.6 sec Subject No.1 sec Subject No.1 sec Subject No.1 sec Subject No.2 sec Subject No.3 sec Subject No.4 sec Subject No.5 sec Subject No.6 sec Subject No.6 sec Comments/Observations	Passed Passed with normal c Passed	Failed Failed

							Page 1
	Manufacture	er:	Date:		_ Time:		
Inflatable Lifejackets	Model:		Surveyor:				
	Lot/Serial N	Lot/Serial Number:Organization:					
2.2.2.14 Preparation for wa	ter performance t	tests	Regulations: LSA Code II/2.2.1.3;	MSC.81(70) 1/2.9.4			
Test Procedure		Acceptan	ce Criteria		Significant Te	st Data	
Preparations for water performate the ability of the lifejacket to a person or one in an exhausted state and to show that the lifejunduly restrict movement. All tests should be carried out under still conditions. The test subjects should wear occurred of six persons as mentioned in para Each test subject should be made each of the tests in 2.2.15 particularly the requirements regard exhaling in the face-down portion of the test subjects should don unassisted, using only the instruby the manufacturer. The observe ease and speed of donning, and adjustment. Only good swimmers should be ability to relax in the water is robtained.	ed to determine ssist a helpless or unconscious acket does not in fresh water only swimming ut with at least graph 2.2.2.12. He familiar with 5 and 2.2.16, garding relaxing osition. the lifejacket, ctions provided yer should note I proper fit and used, since the	When evaluating the results of a test, freeboard and face plan texceptional circumstances, disresubject if the results show a very criteria, provided the Administra can be attributed to the unusual the test subject and the results of	test in accordance with (righting ests the Administration may, in egard the results of a test on a slight deviation from the specified tion is satisfied that the deviation size and stature characteristics of tests on other subjects, chosen in bjects requirements, show the	Subject No.2 _ Subject No.3 _	rime sec. sec. sec. sec. sec. sec. sec. sec	Passed Passed	Failed Failed

	Manufacturer:	_ Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

Lot/Serial Number: Organization:						
2.2.2.15 Water performance tests – Right	ing test	Regulations: LSA C	Code II/2.2.1.3.2;	MSC.81(70) 1/2.9	.5	
Test Procedure	Acceptance Crite	eria		Significan	t Test Data	
The test subject should swim at least three gentle strokes (breaststroke)and then with minimum headway relax, with head down and the lungs partially filled, simulating a state of utter exhaustion. The period of time should be recorded starting from the completion of the last stroke until the mouth of the test subject comes clear of the water. The above test should be repeated after the test subject has exhaled. The time should again be ascertained as above. The freeboard to the mouth, trunk angle and faceplane angle should be recorded after the test subject comes to rest. The test should be conducted using lifejackets that have been inflated both automatically and manually, and also with one of the compartments uninflated. The tests with one of the compartments uninflated should be repeated as many times as necessary to perform the test once with each compartment in the uninflated condition.	The test subject should come to reclear of the water by at least 120 mall subjects' trunk angles should be vertical, and each individual subject at least 20° back of vertical. The subjects' faceplane (head) angles above horizontal, and each individual should be at least 30° above horizontal should be clear of the water in not The lifejacket should not become harm to the test subject. The Administration may, in exceptive subject if the results show a very the specified criteria, provided the satisfied that the deviation can be unusual size and stature character subject and the results of tests on the satisfactory performance of the under comments/observations.	mm. The average of be at least 30° back of ect's angle should be average of all should be at least 40° dual subject's angle ontal. The mouth a more than 5 sec. dislodged or cause obtional lets of a test on a slight deviation from a Administration is attributed to the istics of the test other subjects show	Subject No.1 Manual inflated Auto inflated With chamber 1 With chamber 3 With chamber 4 Subject No.2 Manual inflated Auto inflated With chamber 1 With chamber 1 With chamber 2 With chamber 3 With chamber 3 With chamber 4 Subject No.3 Manual inflated Auto inflated Auto inflated With chamber 1 With chamber 1 With chamber 3 With chamber 3 With chamber 4 Subject No.4 Manual inflated Auto inflated Auto inflated Auto inflated With chamber 1 With chamber 3 With chamber 3 With chamber 3 With chamber 3		(mm)	

			Page 11:
	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2.2.2.15 Water performance	ce tests - Righting test (continued)	Regulations: LSA Code II/2.2.1.3	.2; MSC.81(70) 1/2.9.5
Test Procedure	Ac	ceptance Criteria	Significant Test Data
		Minimum Average to Minimum Average for Did the	flated ted ber 1

ruge III			
	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.16 Water performance tests - Drop test	Regulations: LSA Code		de II/2.2.1.3; MSC.81(70) 1/2.9.45			
Test Procedure	Acceptance Criteria		Significant Test Data			ta
Without readjusting the lifejacket, the test subject should jump vertically into the water, feet first, from a height of at least 4.5 m. When jumping into the water, the test subject should be allowed to hold on to the lifejacket during water entry to avoid possible injury. The freeboard to the mouth should be recorded after the test subject comes to rest. The freeboard to the mouth, trunk angle and faceplane angle should be recorded after the test subject comes to rest The test should be conducted using lifejackets that have been inflated both automatically and manually, and also with one of the compartments uninflated. The tests with one of the compartments uninflated should be repeated as many times as necessary to perform the test once with each compartment in the uninflated condition.	of the water by at least 120 mm subjects' trunk angles should be vertical, and each individual subje least 20° back of vertical. The a faceplane (head) angles should horizontal, and each individual sul at least 30° above horizontal. The become dislodged or cause harm to the Administration may, in exce disregard the results of a test on show a very slight deviation from provided the Administration in deviation can be attributed to the uncharacteristics of the test subject a on other subjects show the satisf the lifejacket. Explain under communication of the subjects and the satisf the lifejacket. Explain under communications are subjects.	at least 30° back of at least 30° back of at least 30° back of at verage of all subjects' be at least 40° above bject's angle should be e lifejacket should not to the test subject. The average of all subjects' be at least 40° above bject's angle should be e lifejacket should not to the test subject. The average of all subjects' be at least 40° above bject's angle should be a lifejacket should not to the test subject. The average of all subjects' and the results of the results of tests actory performance of			Trunk Angle (degs.)	Faceplane Angle (degs.)

					Page 115
	Manufacturer:	Date:		Time:	
Inflatable Lifejackets	Model:	Surveyor:			
	Lot/Serial Number:	Organiza	ition:		
2.2.2.16 Water perform	rmance tests – Drop test (continued)	Regulations: LSA C	Code II/2.2.1.3; MSC.81(70) 1/2.9.4	I5	
Test Procedure	dure	Acceptance Criteria	Sig	gnificant Test Data	
			With chamber 3 With chamber 4 Subject No.6 Manual inflated Auto inflated With chamber 1 With chamber 2	mm le: Deg. cts: Deg e (head) angle: Deg e, all subjects: Deg dislodged or cause har or dislodged?: the in accordance with the	rm to the test

ruge 110			
	Manufacturer:	_ Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.17 Swimming and water emergence tes	t	Regulations: LSA Code II/2.2.1.4;	MSC.81(70) 1/2.9.9		
Test Procedure	Acceptance Criteria		Significant Test Data		
All test subjects, without wearing the lifejacket, should attempt to swim 25 m and board a liferaft or rigid platform with its surface 300 mm above the water surface. All test subjects who successfully complete this task should perform it again wearing the lifejacket.	without the lifejacket should also lifejacket.				

			1 480 117
	Manufacturer:	_ Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.18 Children's lifejacket - Test subjects	Regulations: LSA Code II/2.2.1.5; MSC.81(70) 1/2.10.1 – 2.10.2				
Test Procedure	Acceptance Criteria	Significant Test Data			
Test subjects should be selected to fully represent the range of sizes for which the device is to be approved. Devices for smaller children should be tested on children as small as approximately 760mm tall and 9kg mass. At least six test subjects should be used for each 380mm and 16 kg of size range. Preparations for water performance tests. 1. Subjects should wear only swimming costumes; 2. As far as practical, only good swimmers who can relax in the water should be used; 3. The test subjects should be made familiar with each of the tests set out below and the requirement to relax and exhale while facedown; and 4. All tests should be carried out in fresh water under still conditions. Note: Water tests using children should avoid causing distress or risk to the child. Consideration should be taken of their age and ability.	Height Weight 0.76 m to 1.14 m; 9 kg to 25 kg at least 6 persons 1.14 m to 1.52 m; 25 kg to 41 kg at least 6 persons over 1.52 m 41 kg to 57 kg at least 6 persons When conducting water performance tests under 2.2.2.19 - 20, child-size lifejackets should meet the following requirements for their critical flotation stability characteristics. The range of sizes for child-size lifejackets should be considered based on the test results. Devices should be sized by height or by height and weight.	Check the format on the test subjects table			

M	anufacturer:		Date: Time:
Inflatable Lifejackets M	odel:		Surveyor:
Lo	ot/Serial Number:		Organization:
2.2.2.19 Children's lifejacket tests -	Water performance tests - Righting te	st Regulati	ations: LSA Code II/2.2.1.5; MSC.81(70) 1/2.10.2.1
Test Procedure	Acceptance Crit	eria	Significant Test Data
The test subject should swim at leagentle strokes (breaststroke) and the minimum headway relax, with head of the lungs partially filled, simulating a utter exhaustion. The test should be after the test subject has exhaled. Record time from completion of last until mouth comes clear of the water. The freeboard to the mouth, trunk are faceplane angle should be recorded after subject comes to rest.	following requirements for flotation stability characterist state of repeated must turn face-up in not most stroke The combined results for the water for all subjects shall least 90 mm; each individu 1270 mm and 23 kg should mm clearance, and each individusingle, and	or their critical stics. ividual subject ore than 5 s. clearance above ould average at al subject under have at least 50 dividual subject should have at s' trunk angles of vertical, and ould be at least ould be at least ects' faceplane least 35° above ridual subject's	Turning time 1 Turning time 2 Freeboard Trunk Angle Head angle sec sec mm degrees degrees Subj.No.1

Manufactur	er:		_ Date: Time:
Inflatable Lifejackets Model:		;	Surveyor:
Lot/Serial N	Number:		Organization:
2.2.20 Children la life in de Adams Western	ufa		
2.2.2.20 Children's lifejacket tests - Water pe		Regulation	tions: LSA Code II/2.2.1.5; MSC.81(70) 1/2.10.2.1
Test Procedure	Acceptance Criteria		Significant Test Data
Without readjusting the lifejacket, the test subject should jump vertically into the water, feet first, from a height of at least 4.5 m. When jumping into the water, the test subject should be allowed to hold on to the lifejacket during water entry to avoid possible injury. The freeboard to the mouth, trunk angle, and faceplane angle should be recorded after the test subject comes to rest	Child-size lifejackets should a following requirements for the flotation stability characteristics. The combined results for clearar the water for all subjects should a least 90 mm; each individual sub 1270 mm and 23 kg should have a mm clearance, and each individu over 1270 mm and 23 kg should least 75 mm clearance. The average of all subjects' trushould be at least 40° back of vereach individual's result should be 20° back of vertical. The average of all subjects' (head) angles should be at least 3 horizontal, and each individual result should be at least 20 horizontal.	ir critical nce above average at ject under at least 50 al subject d have at nk angles rtical, and be at least faceplane 35° above subject's	Freeboard Trunk Angle Head angle degrees degrees

1 480 120			
	Manufacturer:	Date:	Time:
Inflatable Lifejackets	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.2.21 Children's lifejacket mobility test	Regulations: LSA Code II/2.2.1.		5; MSC.81(70) 1/2.10.2.5
Test Procedure	Acceptance (Criteria	Significant Test Data

2.2.3 LIFEJACKET/IMMERSION SUIT LIGHTS

EVALUATION AND TEST REPORT

Remarks: If an immersion suit is designed to be worn without a lifejacket, it should be fitted with a light complying with the requirements for lifejacket lights.

The immersion suit light should be treated as a lifejacket light.

2.2.3.0	General Information		
	2.2.3.0.1	General Data and Specifications	
	2.2.3.0.2	Submitted drawings, reports and documents	
2.2.3.1	Visual Insp	ection	
	2.2.3.1.1	Approval Marking	
	2.2.3.1.2	Expiry Marking	
	2.2.3.1.3	Additional Markings	
	2.2.3.1.4	Electrical Short Circuit Protection	
	2.2.3.1.5	Visibility when attached to a Lifejacket	
	2.2.3.1.6	Construction and Materials	
2.2.3.2	Temperature Cycling Test		
2.2.3.3	Light Tests		
2.2.3.4	Chromatici	ty Test	
2.2.3.5	Drop Test		
2.2.3.6	2 m Light Drop Test		
2.2.3.7	Switch Arrangement Test		
2.2.3.8	Vibration Test		
2.2.3.9	Mould Growth Test		
2.2.3.10	Corrosion and Seawater Resistance Test		
2.2.3.11	Test for Oil Resistance		
2.2.3.12	Rain Test and Watertightness Test		
2.2.3.13	Fire Test		

2.2.3 LIFEJACKET/IMMERSION SUIT LIGHTS

EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

	Manufacturer:	Date:	Time:
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.3.0.1 General Data and Specifications Regulations: LSA Code; MSC.81(70)		
General Information	Lifejacket Light Dimensions	Lifejacket Light Weight
TYPE OF SWITCHING: Automatic Manual		Comments/Observations
FLASHING LIGHT		
STEADY LIGHT		

Page 124					
	Manufacturer	:	Date:	Time:	
Lifejacket Lights Model:			Surveyor:		
	Lot/Serial Nu	mber:	Organization:		
2.2.3.0.2 Submitted	d drawings, reports and d	ocuments			
		Submitted drawings and	d documents		Status
Drawing No.	Revision No. & date		Title of drawing		
	•	Submitted reports and	documents		a
D 4/D 43					Status
Report/Document No.	Revision No. & Date		Title of report / document		
		Maintenance Manual -			
		Operations Manual -			

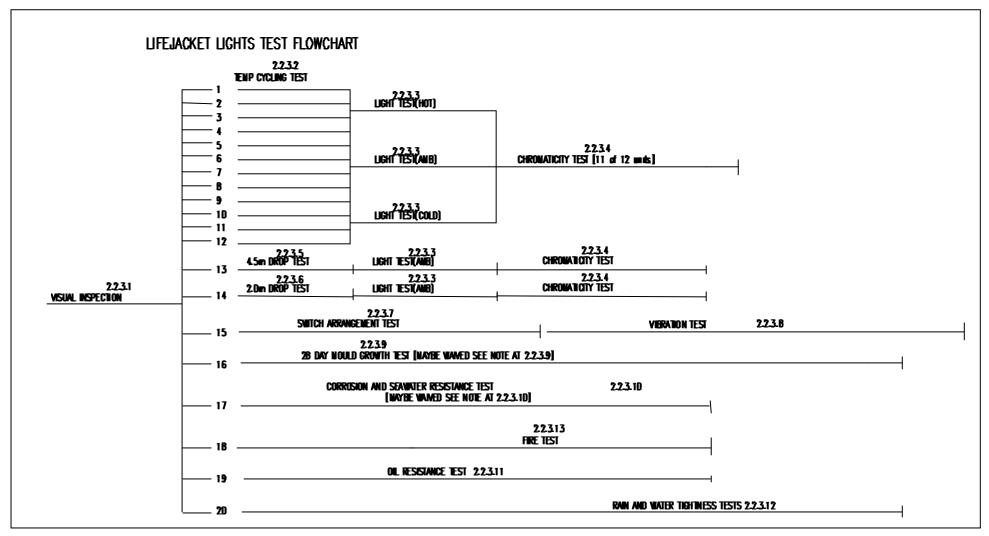
	Manufacturer:	Date:	Time:
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.3.1 Visual Inspection	3.1 Visual Inspection Regulations: LSA Code 1.2.2.1/1			
Test Procedure	Acceptance Criteria		Significant Test Data	
Twenty lifejacket lights should be examined in detail for the following items:	The lifejacket lights should:	Results:		
Approval marking	 be clearly marked with approval information incleaded Administration which approved it, and any operatrictions; 		FAIL:	
	- be marked with a date of expiry;	PASS:	FAIL:	
Expiry marking	The Administration should determine the	Results:		
	- period of acceptability, due to deterioration with ag established life must be justified by the manufactur		FAIL:	
Additional markings	Be provided with the following information:	Results:		
	- precise definition of intended use (e.g. "Lifejacket I serial number; identification of the manufacturer; easily understandable symbols for on/off switching where applicable, information on proper battery by the words: "DO NOT INCINERATE / I RECHARGE / DO NOT TAMPER";	PASS: PASS: PASS: PASS: PASS: PASS:	FAIL: FAIL: FAIL: FAIL: FAIL:	
		Comments/Obse	ervations	

1 age 120	Manufacturer:	_ Date:	_ Time:
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.3.1 Visual Inspection (continued) Regulations: LSA Code 1.2.2.1/1			.2.2.9/1.2.2.10/1.2.3/2.2.3.1.3	
Test Procedure	Acceptance Criteria		Significant Test Data	
	The lifejacket lights should:		Results:	
Electrical short circuit protection	_	be provided with electrical short circuit protection to prevent damage or injury;		FAIL:
Visibility when attached to a lifejacket		- be visible over as great a segment of the upper hemisphere as is practicable when attached to a lifejacket;		FAIL:
Construction and materials	- be constructed with proper workmanship and materials; and		PASS:	FAIL:
	- if the light is a flashing l operated switch.	if the light is a flashing light, be provided with a manually operated switch.		FAIL:
			Comments/Observations	

	Manufacturer:	Date:	Time:
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	



1 agc 120			
	Manufacturer:	Date:	Time:
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.3.2 Temperature Cycling Test	Regulations: LSA Code 1.2.2.2;	MSC.81(70) 1/1.2/1.2.1/1.2.2/10.3/10.3.1/10.3.2	
Test Procedure	Acceptance Criteria	Significant Test Data	
Twelve lifejacket lights which have passed the visual inspection should be subjected to temperature cycling. The following test should be carried out on twelve lifejacket lights: The lifejacket lights should be alternately subjected to surrounding temperatures of not less than -30°C and at least +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of not less than 10 cycles, is acceptable: 1. at least an 8 h cycle at not less than +65°C to be completed in one day; and 2. the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions until the next day; 3. at least an 8 h cycle at not less than 30°C to be completed the next day; and 4. the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions until the next day. After having passed the temperature cycling test the lights should be subjected next to the light tests.	The lifejacket lights should not be damaged in stowage throughout the air temperature range of at least –30°C to +65°C. The lifejacket lights should show no sign of loss of rigidity under high temperatures and, after the tests, should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should function after the test.	Results: PASS: FAIL: Attach temperature cycling chart to record times spent at each temperature. Comments/Observations	

	Manufacturer:	Date:	Time:
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.3.2	Temperature cycling test – Test dat	a	Regulations: LSA Code 1.2.2.2; MSC.81(70) 1/ 1.2/1.2.1/1.2.2/10.3/10.3.1/10.3.2	
	HOT CYCLE COLD CYCLE			COLD CYCLE
Cycle 1	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: hours
Cycle 2	Date In: Time In : Temperature : C	Date Out: Time Out: hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: hours
Cycle 3	Date In: Time In : Temperature : C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours
Cycle 4	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours
Cycle 5	Date In: Time In : Temperature : 0 C	Date Out: Time Out: hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours
Cycle 6	Date In: Time In : Temperature : OC	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours
Cycle 7	Date In: Time In : Temperature : OC	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours
Cycle 8	Date In: Time In : Temperature : OC	Date Out: Time Out: hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: hours
Cycle 9	Date In:	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration :hours
Cycle 10	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration :hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: hours

1 450 150				
	Manufacturer:	Date:	Time:	
Lifejacket Lights	Model:	Surveyor:		
	Lot/Serial Number:	Organization:		

2.2.3.3 Light Tests	Regulations: LSA Code 1.2.2.3/. 10.3.5.2/10.3.5.3/10.4/10.4.9	Regulations: LSA Code 1.2.2.3/2.2.3.1.1/2.2.3.1.2/2.2.3.2.2; MSC.81(70) 1/ 10.3.2/10.3.10.3.5.2/10.3.5.3/10.4/10.4.9	
Test Procedure	Acceptance Criteria	Significant Test Data	
Four lifejacket lights which have passed the temperature cycling test should be taken from a stowage temperature of -30°C and then be operated immersed in seawater at a temperature of -1°C, four lifejacket lights which have passed the temperature cycling test should be taken from a stowage temperature of +65°C and be operated immersed in seawater at a temperature of +30°C, and four lifejacket lights which have passed the temperature cycling test should be taken from ordinary room conditions and be operated immersed in freshwater at ambient temperature. If the voltage at 5 min of operation is lower than the recorded voltage at the end of life it is permissible to use a lamp from the same build standard for the light output test. Using the lowest recorded voltage a light output test can be carried out as described below. The voltage of all 12 test units should be monitored continuously for 8 h. To make sure that all test units provide a luminous intensity of not less than 0.75 cd in all directions of the upper hemisphere for 8 h operation, the following test should be performed.	Water-activated lifejacket lights should commence functioning within 2 min and have reached a luminous intensity of not less than 0.75 cd within 5 min in seawater. In freshwater a luminous intensity of not less than 0.75 cd should have been attained within 10 min. At least 11 out of the 12 lifejacket lights should continue to provide a luminous intensity of not less than 0.75 cd in all directions of the upper hemisphere for a period of at least 8 h. In the case of a flashing light it should be established that the rate of flashing for the 8 h operative period is not less than 50 flashes and not more than 70 flashes per minute and that the effective luminous intensity is at least 0.75 cd in all directions of the upper hemisphere. (See formula below to calculate the effective luminous intensity).	Results: All luminous intensity data is to be attached here. PASS: FAIL: Comments/Observations	

	Manufacturer:	Date: Time:	
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2.2.3.3 Light Tests	s (continued)	Regulations: LSA Code 1.2.2.3/2.2.3.1.1/2.2.3.1.2/2.2.3.2.2; MSC.81(7)	70) 1/ 10.3.2/10.3.5/

2.2.3.3 Light Tests (continued)		Regulations: LSA Code 1.2.2 10.3.5.2/10.3.5.3/10.4/10.4.9	3/2.2.3.1.1/2.2.3.1.2/2.2.3.2.2; MSC.81(70) 1/ 10.3.2/10.3.5/
Test Procedure	Acceptance	ce Criteria	Significant Test Data
It must be demonstrated that at least one light from each of the specified temperature ranges reaches the required luminous intensity in all directions of the upper hemisphere when using a photometer which is calibrated to the photometric standards of the appropriate National or State Standard Institute (Note: CIE Publ. No. 70 contains further information.). The lowest voltage light of the cold temperature test sample lot, the highest voltage light of the high temperature test sample lot and the mean voltage light of the ambient temperature sample lot should be selected. These three lights must be used for the light output tests. In the event that a lamp filament burns out during the light output test, a second light from the same performance test lot may be used. Luminous intensity should be measured by a photometer directed at the center of the light source with the test light on a rotating table. Luminous intensity should be measured in a horizontal direction at the level of the center of the light source and continuously recorded through a 360° rotation.	The effective luminous intensity is $ \begin{bmatrix} \int_{t_1}^{t_2} I dt \\ \hline{0.2 + (t_2 - t_1)} \end{bmatrix} $ where: I is the instantaneous intensity, 0.2 is the Blondel-Rey constant an t1 and t2 are time limits of integrat	max	Comments/Observations

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	Manufacturer:	Date:	Time:
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.3.3 Light Tests (continued)	Regulations: LSA Code 1.2.2.3 10.3.5.2/10.3.5.3/10.4/10.4.9	Regulations: LSA Code 1.2.2.3/2.2.3.1.1/2.2.3.1.2/2.2.3.2.2; MSC.81(70) 1/ 10.3.2/10.3 10.3.5.2/10.3.5.3/10.4/10.4.9	
Test Procedure	Acceptance Criteria	Significant Test Data	
The first measurement should be taken at 0° (horizontal) and should continue to be taken in azimuth angle at 5° intervals to a single measurement at 90° (vertical). Luminous intensity should be measured in a vertical direction, beginning at the center of the light source at the point of lowest recorded light output, and continuously recorded through an arc of 180°. All measured data of luminous intensity and voltage should be documented. After having passed the light tests the lights should be subjected next to the chromaticity test.	Note: Flashing lights with a flash duration of not less than 0.3 s at or above 0.75 cd, not including incandescence time, may be considered as fixed lights for the measurement of luminous intensity. Such lights should provide the required luminous intensity in all directions of the upper hemisphere. (Incandescence time is the time interval between switch on and the luminous intensity reaching the required minimum luminous intensity.)	Comments/Observations	

	Manufacturer:	Date:	Time:
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.3.4 Chromaticity Test Regulations: LSA Code 2.2.3.1.4		4; MSC.81(70) 1/10.3.2/10.4/10.4.10	
Test Procedure	Acceptance Criteria	Significant Test Data	
At least 11 out of the 12 lifejacket lights which have passed the light tests should be tested for chromaticity to determine that it lies within the boundaries of the area "white" of the diagram specified for each colour by the International	The measured chromaticity coordinates should fall within the boundaries of the area of the diagram as per CIE. The boundaries of the area for white lights are given by the following corner coordinates:	Results: All chromaticity dada is to be attached here.	
Commission on Illumination (CIE). The chromaticities of the lifejacket lights should be measured by means of colorimetric measurement	x 0.500 0.500 0.440 0.300 0.300 0.440 y 0.382 0.440 0.433 0.344 0.278 0.382	PASS: FAIL:	
equipment which is calibrated to the appropriate National or State Standards Institute (Note: CIE Publ. No. 15.2 contains further information.). Measurement on at least four points of the upper hemisphere should be taken	(International Standard on Colours of Light Signals, with colour tables to be developed by CIE.)	Comments/Observations	

1 agc 13+			
	Manufacturer:	Date:	Time:
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.3.5 Drop Test	Regulations: LSA Code 2.2.1.1.5	5; MSC.81(70) 1/2.9.6/10.3.2/10.3.3
Test Procedure	Acceptance Criteria	Significant Test Data
One lifejacket light which has passed the visual inspection should be attached to a lifejacket and then be subjected to a drop test as follows: Without readjusting the lifejacket, the test subject should jump vertically into the water, feet first, from a height of at least 4.5 m. When jumping into the water, the test subject should be allowed to hold on to the lifejacket during water entry to avoid possible injury. For the approval of the lifejacket light, the test result obtained from the participating subject should be acceptable except as provided otherwise.	The lifejacket light should not suffer damage, should not be dislodged from the lifejacket and should not injure the wearer and should function after the test. Water-activated lights should commence functioning within 2 min and have reached a luminous intensity of not less than 0.75 cd within 5 min in seawater. In freshwater a luminous intensity of not less than 0.75 cd should have been attained within 10 min. The light should continue to provide a luminous intensity of not less than 0.75 cd in all directions of the upper hemisphere for a period of at least 8 h. (For further details see Light Tests). The measured chromaticity coordinates should fall within the boundaries of the area of the diagram as per CIE. The boundaries of the area for white lights are given by the following corner coordinates: x 0.500 0.500 0.440 0.300 0.300 0.440 y 0.382 0.440 0.433 0.344 0.278 0.382 (International Standard on Colours of Light	Results: PASS: FAIL: Comments/Observations
After this drop test the light should be taken from ordinary room conditions and operate immersed in freshwater at ambient temperature. The light should be subjected next to the light tests (see 2.2.3.3) and to the chromaticity test (see 2.2.3.4).	Signals, with colour tables to be developed by CIE.) (For further details see Chromaticity Test).	

			1 480 150
	Manufacturer:	Date:	Time:
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.3.6 2 m Light Drop Test Regulations: MSC.81(70) 1/10.		3.4	
Test Procedure	Acceptance Criteria	Significant Test Data	
One lifejacket light which has passed the visual inspection should be dropped from a height of 2 m onto a rigidly mounted steel plate or concrete surface.	The lifejacket light should not suffer damage and should be capable of providing a luminous intensity of not less than 0.75 cd for a period of at least 8 h when operated immersed in freshwater at ambient temperature. (For further details see Light Tests at 2.2.3.3).	Results: PASS:	FAIL:
After this test the light should be taken from ordinary room conditions and operate immersed in freshwater at ambient temperature.	temperature. (For further details see Light Tests at 2.2.3.3).	Comments/Observations	PAIL.
The light should be subjected next to the light tests (see 2.2.3.3).			

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Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.3.7 Switch Arrangement Test		Regulations: MSC.81(70) 1/10.	3.5/10.3.5.1/10.4/10.4.3	
Test Procedure	Acceptano	ce Criteria	Significant Test Data	
If a manual switch is fitted, the switch arrangement test should be carried out.	The light must function properly.		Results:	
One lifejacket light which has passed the visual inspection should be subjected to the switch arrangement test.			PASS:	FAIL:
A test person wearing immersion suit gloves, must be able to switch the lifejacket light in its normal operational position on and off three times. After having passed the switch arrangement test the light should be subjected next to the vibration test.			Comments/Observations	
2.2.3.8 Vibration Test		Regulations: LSA Code 1.2.2.1/2	1.2.2.8; MSC.81(70) 1/10.4	4/10.4.1
Test Procedure	Acceptano	ce Criteria	Significant Test Data	
The lifejacket light which has passed the switch arrangement test should be subjected to a vibration test according to IEC 945, paragraph	The lifejacket light should be constructed with proper workmanship and materials		Results:	
8.7.	The lifejacket light should function	n after the test.	PASS:	FAIL:
			Comments/Observations	

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Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
-	·	·	

2.2.3.9 Mould Growth Test	Regulations: LSA C	Regulations: LSA Code 1.2.2.4; MSC.81(70) 1/10.4/10.4.2		
Test Procedure	Acceptance Criteria		Significant Test Data	
One lifejacket light which has passed the visual inspection should be subjected to the mould growth test. The lifejacket light should be inoculated by spraying with an aqueous	The lifejacket light should be rot-proof and not be unduly fungal attack. There should be no mould growth visible to the naked expression of the should be rot-proof and not be unduly fungal attack.		Results:	FAIL:
suspension of mould spores containing all the following cultures:	lifejacket light should function after the test.			111121
Aspergillus niger; Aspergillus terreus; Aureobasidium pullulans; Paecilomyces variotii; Penicillium funiculosum, Penicillium ochro- chloron; Scopulariopsis brevicaulis; and Trichoderma viride.			Comments/Observations	
The lifejacket light should then be placed in a mould growth chamber which should be maintained at a temperature of 29°C +/- 1°C and a relative humidity of not less than 95 %. The period of incubation should be 28 days. After this period the lifejacket light should be inspected.				
(Note: The mould growth test may be waived where the manufacturer is able to produce evidence that the external materials employed will satisfy the test.)				

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	Manufacturer:	Date:	Time:
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.3.10 Corrosion and Seawater Resistance Test		Regulations: LSA Code 1.2.2.4;	MSC.81(70) 1/10.4/10.4.4	
Test Procedure	Acceptance Criteria		Significant Test Data	
One lifejacket light which has passed the visual inspection should be subjected to a corrosion and seawater resistance test according to IEC 945,	The lifejacket light should be corraffected by seawater.	rosion resistant and not be unduly	Results:	
paragraph 8.12.	Furthermore, the lifejacket li requirements of IEC 945 paragraph	ght should comply with the 18.12.2.	PASS:	FAIL:
.1 If there are no exposed metal parts the Corrosion and Seawater Resistance Test need not be conducted.	There should be no undue dete lifejacket light should function after	rioration of metal parts and the er the test.	Comments/Observations	
.2 The Corrosion and Seawater Resistance Test may be waived where the manufacturer is able to produce evidence that the external metals employed will satisfy the test.				
.3 Automatic activated version should be prevented from switching during the test.)				
.4 Where the exposed metal is part of the automatic switch sensor, the function test after the 28 day test cannot be done.				

	Manufactur	er:	Date:	Time:	
Lifejacket Lights	Model:		Surveyor:		
	Lot/Serial N	Number:	Organization:		
2.2.3.11 Test for Oil Resist	ance		Regulations: LSA Code 1.2.2.4;	MSC.81(70) 1/10.4/10.4.6	
Test Procedure		Acceptano	ce Criteria	Significant T	est Data
One lifejacket light which has painspection should be subjected to resistance according to IEC 945, Automatic activated version should from switching during the test.	the test for oil paragraph 8.11.		•	Results: PASS: Comments/Observations	FAIL:
2.2.3.12 Rain Test and Watertightness Tes		st	Regulations: LSA Code 1.2.2.4/	1.2.2.8; MSC.81(70) 1/10.4/10.4	1.7
Test Procedure		Acceptano	ce Criteria	Significant T	est Data
One lifejacket light which has painspection should be subjected according to IEC 945, paragraph 8 After having passed the rain test light and the complete power so immersed horizontally under norm of fresh water for at least 24 light.	to a rain test 3.8. st the lifejacket burce should be t less than 300	paragraph 8.8.2 and should function	with the requirements of IEC 945, on after the rain test. ifejacket light should function and	Results: PASS: Comments/Observations	FAIL:
Automatic activated version shou from switching during the test.	ld be prevented				

1 agc 140	Manufacturer:	_ Date:	Time:
Lifejacket Lights	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.2.3.13 Fire Test	Regulations: LSA Code 2.2.1.1;	MSC.81(70) 1/10.4/10.4.8	
Test Procedure	Acceptance Criteria	Significant Test Data	
One lifejacket light which has passed the visual inspection should be subjected to a fire test. A test pan not less than 30 cm x 35 cm x 6 cm should be placed in an essentially draught-free area. Water should be put in the bottom of the test pan to a depth of at least 1 cm followed by enough petrol to make a minimum total depth of not less than 4 cm. The petrol should then be ignited and allowed to burn freely for at least 30 s. The lifejacket light should then be moved through the flames, facing them, with the lifejacket light not more than 25 cm above the top edge of the test pan so that the duration of exposure to the flames is at least 2s.	The lifejacket light should not sustain burning or continue melting after being totally enveloped in a fire for a period of at least 2 s and after being removed from the flames. The lifejacket light should function after the test.	Results: PASS: FAIL: Comments/Observations	

2.3 IMMERSION SUITS AND ASSOCIATED EQUIPMENT

2.3.1 IMMERSION SUITS (NON-INSULATED)

EVALUATION AND TEST REPORT

2.3.1.1	General data and specifications
2.3.1.2	Submitted drawings, reports and documents
2.3.1.3	Quality assurance
2.3.1.4	Visual inspection
2.3.1.5	Test subjects
2.3.1.6	Test with a lifejacket
2.3.1.7	Test clothing
2.3.1.8	Donning tests 1 & 2
2.3.1.9	Ergonomic test
2.3.1.10	Field of vision test
2.3.1.11	Flotation test
2.3.1.12	Righting test
2.3.1.13	Water ingress and jump test
2.3.1.14	Jump test
2.3.1.15	Leak test
2.3.1.16	Swimming and water emergence test
2.3.1.17	Oil resistance test
2.3.1.18	Alternative oil resistance test
2.3.1.19	Fire test
2.3.1.20	Temperature cycling test
2.3.1.21	Temperature cycling test - Test data
2.3.1.22	Buoyancy test
2.3.1.23	Strength test
2.3.1.24	Thermal protective test (General)
2.3.1.25	Thermal protective test (continued)
2.3.1.26	Test sheets for temperatures during immersion tests

2.3.1 IMMERSION SUITS (NON-INSULATED)

EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

N	Manufacturer:	Date:	Time:
		•	
L	ot/Serial Number:	Organization:	
2.3.1.1 General Data and Speci	ifications	Regulations: LSA Code II/2.3;	MSC.81(70) I/3.1 & 3.2;
Construction Material:	Additional equipment:		Donning instructions:
Fabric produced by:	Retro reflective material produced by:		□YES □ NO
Type:	Type:		
Buoyant material produced by:	Whistle produced by (if fitted):		
Type:	Life-line produced by (if fitted):_ Type		
	Light produced by (if fitted): Type:		

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		Manufacturer	·	Date:	Time:	
Immersion Suits (non-in	sulated)	Model:		Surveyor:		
		Lot/Serial Nu	mber:	Organization:		
2.3.1.2 Submitted	l drawings	s, reports and c	ocuments			
			Submitted drawings and	documents		Status
Drawing No.	Revision	n No. & date		Title of drawing		
	•					
			Submitted reports and	documents		Status
Report/Document No.	Revision	n No. & Date		Title of report / document		
			Maintenance Manual -			
			Operations Manual -			

	Manufacturer:	Date:	Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2.3.1.3 Quality Assurance		Regulations: -	
Except where all appliances of a p International Convention for the S inspected, representatives of the A of manufacturers to ensure that the used comply with the specification Manufacturers should be required t that life-saving appliances are prov saving appliance approved by the A	articular type are required by Chapter III of the Safety of Life at Sea, 1974, as amended, to be administration should make random inspections a quality of life-saving appliances and materials of the approved prototype life-saving appliance. o institute a quality control procedure to ensure ided to the same standard as the prototype life-Administration and to keep records of any redance with the Administration's instructions.	Quality Assurance Standard Used: Quality Assurance Procedure: Quality Assurance Manual: Description of System: Quality Assurance System acceptable Yes Comments/Observations	

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	Manufacturer:	Date:	Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.1.4 Visual Inspection	Regulations: LSA Code I/1.2.	2, II/2.3.1.1.3 & 2.3.1.1.4		
Test Procedure	Acceptance Criteria		Significant Test Data	
Non Insulated Immersion suit should: be clearly marked with approval information including the Administration which approved it, date of manufacturer and any operational restrictions;		Passed	Failed	
be provided with labels giving operating instructions, general information and manufacturers details as appropriate; and		Passed	Failed	
be fitted with approved patches of retro- reflective material with a total area of at least 400 cm ² and with 100 cm ² on the back if the suit does not automatically turn the wearer face up according to IMO Res. 658(16).		Passed	Failed	
		Comments/Observ	vations	

	Manufacturer:	Date:	Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.1.4 Visual Inspection (Continued) Regulations: LSA Code I/1.2.			3.1.1.3 & 2.3.1.1.4	
Test Procedure	Acceptance	ee Criteria	Significa	nt Test Data
Does the non-insulated immersion suit cover the whole body with the exception of the face?			Passed	Failed
Are the hands covered, or is the non-insulated immersion suit equipped with permanently attached gloves?			Passed	Failed
Are their arrangements to prevent excessive free air in the legs?			Passed	Failed
Is the non-insulated immersion suit of highly visible colour?			Passed	Failed
Is the non-insulated immersion suit designed to be worn without a lifejacket? If yes			Passed	Failed
Is the non-insulated immersion suit fitted with a light complying with paragraph 2.2.3?			Passed	Failed
Is the non-insulated immersion suit fitted with a whistle complying with paragraph 2.2.1.8?			Passed	Failed
			Comments/Observations	

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	Manufacturer:	Date:	Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.1.5 Test subjects	t subjects Regulations: LSA Code II/2.3.1.1.5, 2.3.1.3.14; MSC			
Test Procedure	Acceptan	ce Criteria	Significant Test Data	
At least six able-bodied persons both male and females of the following heights and weights should be used. At least one and not more than two of the persons should be females with not more than one female in the same height range.	1 person of 1.60m - 1.80m 1 person of 1 pe	under 60kg over 60kg under 70kg over 70kg under 80kg	Male/Female Height Weight Subject No.1	
2.3.1.6 Test with a lifejacket		Regulations: LSA Code II/2.3.1	.5; MSC.81(70) 1/3.1.2	
Test Procedure	Acceptance Criteria		Significant Test Data	
If the suit is to be worn in conjunction with a lifejacket, the lifejacket should be worn over the suit for the tests prescribed in 2.3.1.8 to 2.3.1.16.			Manufacturer of lifejacket: Type: Manufacturer of lifejacket: Type: Manufacturer of lifejacket: Type: Comments/Observations	

			Time:
Lot/Ser	ıl Number:	Organization:	
2.3.1.7 Test clothing		Regulations: LSA Code II/2.3.1	.1.1; MSC.81(70) 1/3.2.6
Test Procedure	Acceptan	ce Criteria	Significant Test Data
The test subjects should wear a standard ran clothing consisting of	ge		Did all test subject use the specified test clothing
1 underwear (short sleeved, short legged)			□ YES □ NO
 2 shirt(long sleeved) 3 trousers(not woollen, and 4 woollen socks 5 in addition to the clothing the test subshould wear two woollen pullovers dur the thermal protective tests. 			Comments/Observations
2.3.1.8 Donning test (1)	•	Regulations: LSA Code II/2.3.1	.1.1; MSC.81(70) 1/3.1.3
Test Procedure	Acceptan	ce Criteria	Significant Test Data
Following a demonstration, each test subshould be able to unpack, don and secure immersion suit over their test clothing with assistance in less than 2 min. This time sho include the time to don any associated cloth, and a lifejacket, if such is to be worn conjunction with the immersion suit, and test subjects should be able to don so lifejacket without assistance.	immersion suit over their test assistance in less than 2 min. The don any associated clothing, and in conjunction with the immersion in the limit of the conjunction with the immersion in the limit of the conjunction with the immersion in the limit of the conjunction with the immersion in the limit of the conjunction with the immersion in the limit of the conjunction with the immersion and the conjunction with the	le to unpack, don and secure the clothing (see 2.3.1.7) without is time should include the time to a lifejacket, if such is to be worn n suit.	Donning time Time Pass Fail Subject No.1sec Subject No.2sec Subject No.3sec Subject No.4sec Subject No.5sec Subject No.6sec Comments/Observations

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	Manufacturer:	Date:	Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.1.8 Donning test (2)		; MSC.81(70) 1/3.1.4		
Test Procedure	Acceptanc	e Criteria	Significant Test Data	
The immersion suit should be capable of being donned in a reasonable time at an ambient temperature as low as -30° C. Before the donning test the packed immersion suit should be kept in a refrigerated chamber at a temperature of -30° C for 24 h.	The test subject should be able to dime.	complete this task in a reasonable	Donning time at - 30°C Time Subject No.1	Passed Failed

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	ľ	Manufacture	er:	Date:	Time:		
Imme	ersion Suits (non-insulated)	Model:		Surveyor:			
	I	Lot/Serial N	Tumber:	Organization:			
2.3.1.	9 Ergonomic Test			Regulations: LSA Code II/2.3.1	<u> </u>		
	Test Procedure		Acceptance	ce Criteria	Significant	t Test Data	
	n wearing the immersion suit cts should be able to:	t, the test	There should be no restriction i movement. The diameter of the pe	in walking, bending over or arm encil should be 8-10 mm.	Restriction in walking, bendi	ing over or arm 1 ☐ YES	movement: □NO
1.	Climb up and down a vertical at least 5 m in length;	l ladder of			All the test subjects where a write:	able to pick up a	a pencil and NO
2.	Perform all duties associa abandonment; and	ated with			All the test subjects where without assistance:	able to put on th ☐ YES	ne lifejacket □NO
3.	To pick up a pencil and write.				All the test subjects where at associated with abandonmen a rescue boat:		
					All the test subjects where al vertical ladder of 5 meter in		nd down a
						\square YES	□NO
					Comments/Observations		

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	Manufacturer:	_ Date:	_ Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.1.10 Field of vision test		Regulations: LSA Code II/2.3.1.	1.3; MSC.81(70)) 1/3.1.6		
Test Procedure	Acceptance	e Criteria		Significant Tes	t Data	
Each test subject should be seated with the head in a fixed position, and the lateral field of vision measured.	The lateral field of vision should be	e at least 120°.	Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Obs	Passed	Failed	
2.3.1.11 Flotation test		Regulations: LSA Code II/2.3.1.	1; MSC.81(70)	1/3.1.7		
Test Procedure	Acceptance	Acceptance Criteria Signific		Significant Tes	nt Test Data	
With the test subject floating at rest, wearing the suit in conjunction with a lifejacket if required, the freeboard should be measured from the water surface to the nose or mouth.	The test subject should float face-water by at least 120mm and be sta		Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6	Mouth Freeboard =↓	Nose Freeboard = ↓	

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ľ	Manufactur	er:	Date:		Time:	
Immersion Suits (non-insulated)	Model:		Surveyor:			
I	Lot/Serial N	[umber:	Organization:			
2.3.1.12 Righting test			Regulations: LSA Code II/2.3.3	; MSC.81(70) 1/3	.1.8	
Test Procedure		Acceptanc	ee Criteria		Significant T	est Data
The test subjects in fresh water wearing	ng either a	Except where it has been demo	onstrated that the non-insulated		Passed	Failed
non-insulated immersion suit or a non		immersion suit will right the te		Subject No.1		
immersion suit with a lifejacket she demonstrate that they can turn themse		subjects should each demonstrat from a face-down to a face-up pos		Subject No.2 Subject No.3		
a face-down to a face-up position in		from a race down to a race up pos	stron in not more than 3 s.	Subject No.4		
than 5 s.				Subject No.5		
				Subject No.6		
				Comments/Obse	ervations	
2.3.1.13 Water ingress and jun	np test		Regulations: LSA Code II/2.3.3	; MSC.81(70) 1/3	.1.9	
Test Procedure		Acceptance	ce Criteria		Significant T	est Data
The test subjects should pre-wet t		The difference in the combined m	ass of the test subject and the suit	Mass difference	≤ 500g	
insulated immersion suit and then be		should not exceed 500 g.			_	
Following a jump into the water from sufficient to totally immerse the body				Subject No.1	Pass	Fail
subject should be weighed again.	, each test			Subject No.2		
3				Subject No.3		
Weighing should be performed on a	a machine			Subject No.4		
accurate to ± 100g				Subject No.5 Subject No.6		
				Subject No.0		
				Comments/Obse	ervations	

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Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.1.14 Jump test	Regulations	s: LSA Code II/2.3.1	.3.3; MSC.81(70) 1/3.1.10	
Test Procedure	Acceptance Criteria		Significant Test Data	
The test subjects should jump with the suit and lifejacket if required from a height of 4.5m vertically into the water. After the jump, the suit should be examined for damage or dislodging, and the test subject should be questioned concerning whether the suit caused any injury to the wearer.	The test subject should not be injured by the suit		Passed Failed Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations	
2.3.1.15 Leak test	Regulations: LSA Code II/2.3.1.1.1; MSC.81(70) 1/3.1.11			
Test Procedure	Acceptance Criteria		Significant Test Data	
The test subject should pre-wet the immersion suit and be weighed. The test subject should then be instructed to do one of the following: 1. a period of flotation in calm water of 1h; or 2. swimming for 20 min for a distance of at least 200 m The test subject should be weighed again after the task. The weighing machine should be accurate to ± 100g	The ingress of water into the pre-wetted suit mass of 200g.	should not exceed a	Indicate which alternative is used. □ Alternative 1 □ Alternative 2 Water ingress ≤ 200g Passed Failed Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations	

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	Manufacturer:	_ Date:	Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.1.16 Swimming and water emergence to	Regulations: LSA Code II/2.3.1.3.	/3.1.12			
Test Procedure	Acceptance	e Criteria		Significant T	
All test subjects, each wearing a lifejacket but not the suit, should attempt to swim 25 m and board a liferaft or rigid platform with its surface 300 mm above the water surface.	All qualified test subjects should platform while wearing the non-insu		Subject No.1 Subject No.2 Subject No.3	swim and board Passed	
Test subjects who successfully complete this task should also perform it wearing the suit.			Subject No.4 Subject No.5 Subject No.6		
If designed to be used with a lifejacket, then non-insulated immersion suit should be tested with the subject also wearing a lifejacket.			2) 25 m	swim and board Passed	ing with suit Failed
			Subject No.1 Subject No.2 Subject No.3		
			Subject No.4 Subject No.5 Subject No.6		
			· ·	and boarding wit	h suit and a lifejacket,
			Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6	Passed	Failed

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	Manufacturer:	Date:	Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.1.17 Oil resistance test		Regulations: LSA Code; MSC.81(70) 1/3.1.13			
Test Procedure	Acceptano	ce Criteria	Significant Test Data		
After all its apertures have been sealed a non-insulated immersion suit should be immersed for a period of 24 h under 100 mm head of diesel oil at normal room temperature. The surface oil should then be wiped off and the immersion suit subjected to the test prescribed in 2.3.1.16	The ingress of water should not ex	xceed a mass of 200g.	Indicate which alternative is used. □ Alternative 1 □ Alternative 2 Water ingress ≤ 200g Passed Failed Subject No.1 □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		

	Manufacturer:	_ Date:	Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.1.18 Alternative Oil resistance test	Reg	ulations: LSA Code; MSC.	81(70) 1/3.1.14.1 & .2	
Test Procedure	Acceptance Crit	eria	Significan	Test Data
In lieu of the test for oil resistance prescribed in 2.3.1.17 either of the following tests may be conducted. After all apertures have been sealed, the non-insulated immersion suit should be immersed for a period of 24 h under 100 mm head of diesel oil at normal room temperature if necessary using weights to keep suit submerged. Any surface oil should then be wiped off and the non-insulated immersion suit turned inside out. The suit should then be laid on a table suitable for collecting and draining off any leakage and be supported at the neck aperture by a suitable designed hanger. The suit should then be filled with water to neck level which should be 300mm above the table.	After 1h in this position there should be mass of 200g The seam strength should be not less the		Water ingress ≤ 200g Passed Subject No.1 Subject No.2 Subject No.3	Failed
Representative samples of the exterior fabric and seams should be immersed under 100mm head of diesel oil for 24 h. After removal from the oil the samples should be wiped off before being subjected to the following tests: - 1. a hydrostatic test of a 1m water head and 2. a tensile test of representative seams	The samples should successfully suppo	rt 1 m head of water	Passed The samples should support Comments/Observations	Failed a 1 m head of water.

1 uge 130			
	Manufacturer:	Date:	Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.1.19 Fire test		Regulations: LSA Code II/2.3.1.	.1.2; MSC.81(70) 1/3.1.15
Test Procedure	Acceptano	ce Criteria	Significant Test Data
A test pan 30x35x6cm should be placed in an essentially draught-free area. Water should be put in the bottom of the test pan to make a minimum total depth of 1 cm followed by enough petrol to make a minimum dept of 4 cm. The petrol should then be ignited and allowed to burn freely for 30 s. If necessary the immersion suit should be draped over a hanger to ensure the whole of the suit is enveloped in the flames, with the bottom of the suit 25 cm above the top edge of the test pan so that the duration of exposure to the flames is 2 s.	The non-insulated immersion su continue melting after being remo	nit should not sustain burning or oved from exposure to the flames.	Did the immersion suit sustain burning or continue melting after being removed from the flames? ☐ YES ☐ NO Comments/Observations

						Tage 15.
	Manufacture	er:	Date:	Tin	me:	
Immersion Suits (non-insulated)	Model:		Surveyor:			
	Lot/Serial N	Jumber:	Organization:			
2.3.1.20 Temperature cyclin	g test	<u> </u>	Regulations: LSA Code I/1.2.1.	2; MSC.81(70) 1/3.1.16		
Test Procedure		Acceptance	ee Criteria	Sigr	nificant Test Data	
The following test should be carrie immersion suits	ed out on two	The non-insulated immersion sui of damage such as shrinking, sv	ts material should show no signs velling dissolution or changes of	(See following page for	or test data)	
		mechanical qualities.		Passed	Failed	
The non-insulated immersion suitalternately subjected to temperatures of -30°C and +6 alternating cycles need not follow after each other and the following repeated for a total of 10 cycles, is a second of the specimens removed from the	surrounding 55°C. These immediately g procedure, acceptable: completed in m the warm left exposed ons until the ompleted the om the cold left exposed			Comments/Observation	ons	

1 480 100			
	Manufacturer:	Date:	Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.1.21	Temperature cycling test - Test Data		Regulations: LSA Code I/1.2.1; MSC.81(70) 1/3.	1.16
	НС	OT CYCLE	Co	OLD CYCLE
Cycle 1	Date In: Time In : Temperature : OC	Date Out: Time Out:hours	Date In: Time In : Temperature : C	Date Out: Time Out: Duration :hours
Cycle 2	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration :hours
Cycle 3	Date In: Time In : Temperature : OC	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours
Cycle 4	Date In: Time In : Temperature : OC	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: hours
Cycle 5	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : C	Date Out: Time Out:hours
Cycle 6	Date In: Time In : Temperature : OC	Date Out: Time Out:hours	Date In: Time In : Temperature : C	Date Out: Time Out:hours
Cycle 7	Date In: Time In : Temperature : OC	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours
Cycle 8	Date In: Time In : Temperature : OC	Date Out: Time Out:hours	Date In: Time In : Temperature : C	Date Out: Time Out:hours
Cycle 9	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration :hours	Date In: Time In : Temperature : C	Date Out: Time Out:hours
Cycle 10	Date In: Time In : Temperature : OC	Date Out: Time Out:hours	Date In: Time In :0 Temperature :0	Date Out: Time Out:hours

				1 age 10
	Manufacture	er:	Date:	Time:
Immersion Suits (non-insulated)	Model:		Surveyor:	
	Lot/Serial N	Jumber:	Organization:	
2.3.1.22 Buoyancy test			Regulations: LSA Code II/2.3.1.	4: MSC.81(70) 1/3.1.17
Test Procedure		Acceptano	0	Significant Test Data
The buoyancy of a non-insulated suit designed to be worn without should be measured before and complete submersion to just below in fresh water.	a lifejacket after 24 h	The difference between the initial should not exceed 5% of the initial		Buoyancy 1 Buoyancy 2 % differencekg% Passed Failed Comments/Observations
2.3.1.23 Strength test		Regulations: LSA Code II; MSC.81(70) 1/3.1.18		
Test Procedure		Acceptano	ce Criteria	Significant Test Data
The non-insulated immersion suitimmersed in water for a period of immersion suit closed in the same when worn by a person, a force of a 1350N should be applied for 30 mi of the immersion suit that secures it of the wearer.	2 min. The e manner as not less than n to the part	The non-insulated immersion so result of this test.	uit should not be damaged as a	Passed Failed Comments/Observations
Vest-type lifejacket Yoke or over-the-head	**			
The non-inflated immersion suit management to the test	•			

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	Manufacturer:	Date:	Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.1.24 Thermal protective test (General)		Regulations: LSA Code II/2.3.2.1	; MSC.81(70) 1/3.2.1 – 3.2.4
Test Procedure	Acceptano	ce Criteria	Significant Test Data
The thermal protective qualities may be measured using a thermal manikin, when such a method is required by an Administration and has been demonstrated to provide test results which correlate satisfactorily in all aspects to test results using human subjects.			Comments/Observations
If human subjects are used, they should be medically examined before being accepted for the tests. Each design of immersion suit is to be tested by test subjects specified in 2.3.1.5			
Where human subjects are used, the tests should always be conducted under the supervision of physician. Emergency resuscitation equipment should be available during all tests. For safety reasons, ECG should be monitored during every test. Testing should be stopped at the wish of the test subjects, or if the skin temperature of hand, foot or lumbar region should fall below 10° C, or if the attending physician considers it advisable.			
When testing with human subjects, continuous body core temperature (rectal temperature) and skin temperature of lumbar region, both hands, calves, foot (foot instep) and heels, should be measured. The accuracy of the measuring system should be 0.2°C. Appropriate corresponding measurements should be taken if a manikin is used in lieu of human subjects.			

			Page 16.
Ma	anufacturer:	Date:	Time:
Immersion Suits (non-insulated) Mo	odel:	Surveyor:	
Lot	t/Serial Number:	Organization:	
2.3.1,25 Thermal Protective test ((Continued)	Domilations I CA Code II/2 2 2	1.2. MSC 91/70\ 1/2.20.9.2.210
2.3.1.25 Thermal Protective test ((Continued)	Regulations: LSA Code 11/2.3.2	.1.2; MSC.81(70) 1/3.2.9 & 3.2.10
Test Procedure	Acceptar	ice Criteria	Significant Test Data
Prior to tests, the same amount of resulting from the water ingress and ju in 2.3.1.13 should be poured into the own over the dry test clothing speci	amp test should not fall more than 2°C dry suit subject's temperature.	subject's body core temperature below the normal level of the	Same amount of water resulting from the water ingress and jump test in paragraph 2.3.1.13 should be poured into the dry suit.
2.3.1.7 by the test subject lying down.			Beginning End normal of test of test temperature
Each test subject should wear a non-in immersion suit previously subjected to the test in 2.3.1.14. Following a 1 h perimmersion, with hands gloved, in circular water at +5° C, each test subject core temperature should not fall more than the following the subject to the subje	he jump eriod of culating t's body han 2° C		Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6
below the normal level of the statement temperature.	subject s		Passed Failed
The non-insulated immersion suit provide sufficient thermal protection to			Pick up a pencil and write after 1 h period of immersion:
that immediately on leaving the water completion of the test prescribed above test subject can pick up a pencil as spect 2.3.1.9 and write.	ter after ve each		Subject No 1 □ YES □ NO Subject No 2 □ YES □ NO Subject No 3 □ YES □ NO Subject No 4 □ YES □ NO Subject No 5 □ YES □ NO Subject No 6 □ YES □ NO
			Passed Failed
			Comments/Observations See attached test sheets for temperatures during the immersion tests.
1			

	Manufacturer:	_ Date:	Time:
Immersion Suits (non-insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.1.3.26 Test sheets for temp	2.1.3.26 Test sheets for temperatures during immersion tests			1.2; MSC.81(70) 1/3.2.9& 3.2.	
SUBJECT 1	SUBJECT 2	SUBJECT 3	SUBJECT 4	SUBJECT 5	SUBJECT 6
Rectal temp after 1 hr:	Rectal temp after 1 hr:	Rectal temp after 1 hr:	Rectal temp after 1 hr:	Rectal temp after 1 hr:	Rectal temp after 1 hr:
				Skin temp at lumbar region after 1 hr:	Skin temp at lumbar region after 1 hr:
Skin temp at left hand after 1 hr:	Skin temp at left hand after 1 hr:				Skin temp at left hand after 1 hr:
Skin temp at right hand after 1 hr:		Skin temp at right hand after 1 hr:		Skin temp at right hand after 1 hr:	Skin temp at right hand after 1 hr:
Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:
Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:
Skin temp at right foot (foot instep) after 1 hr:	Skin temp at right foot (foot instep) after 1 hr:	Skin temp at right foot (foot instep) after 1 hr:	Skin temp at right foot (foot instep) after 1 hr:	Skin temp at right foot (foot instep) after 1 hr:	Skin temp at right foot (foot instep) after 1 hr:
Skin temp at left heel after 1 hr:	Skin temp at left heel after 1 hr:	Skin temp at left heel after 1 hr:		Skin temp at left heel after 1 hr:	Skin temp at left heel after 1 hr:

2.3.2 IMMERSION SUITS (INSULATED)

EVALUATION AND TEST REPORT

2.3.2.1	General data and specifications
2.3.2.2	Submitted drawings, reports and documents
2.3.2.3	Quality assurance
2.3.2.4	Visual inspection
2.3.2.5	Test subjects
2.3.2.6	Test with a lifejacket
2.3.2.7	Test clothing
2.3.2.8	Donning tests 1 & 2
2.3.2.9	Ergonomic test
2.3.2.10	Field of vision test
2.3.2.11	Flotation test
2.3.2.12	Righting test
2.3.2.13	Water ingress and jump test
2.3.2.14	Jump test
2.3.2.15	Leak test
2.3.2.16	Swimming and water emergence test
2.3.2.17	Oil resistance test
2.3.2.18	Alternative Oil resistance test
2.3.2.19	Fire test
2.3.2.20	Temperature cycling test
2.3.2.21	Temperature cycling test - Test data
2.3.2.22	Buoyancy test
2.3.2.23	Strength test
2.3.2.24	Thermal protective test (General)
2.3.2.25	Thermal protective test (continued)
2.3.2.26	Test sheets for temperatures during immersion tests

2.3.2 IMMERSION SUITS (INSULATED)

EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

	Manufacturer:	Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2.3.2.1 General Data and S	pecifications	Regulations: LSA Code 2.3; M	ISC.81(70);
Construction Material:	Additional equipment:		Donning instructions:
Fabric produced by:	Retro reflective material produced by:		□ YES □ NO
Туре:	Type:		
Buoyant material produced by:	Whistle produced by (if fitted):		
Туре:	Life-line produced by (if fitted):_ Type		
	Light produced by (if fitted): Type:		

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Manufacturer:		Manufacturer:		Date:	Time:	Time:	
Immersion Suits (insulat	ted)	Model:		Surveyor:			
		Lot/Serial Nu	mber:	Organization:			
2.3.2.2 Submitted	l drawing	gs, reports and d	locuments				
			Submitted drawing	gs and documents		Status	
Drawing No.	Revisio	on No. & date		Title of drawing			
			Submitted report	s and documents		Status	
Report/Document No.	Revisio	on No. & Date		Title of report / document			
			Maintenance Manual -				
			Operations Manual -				

	Manufacturer:	Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2.3.2.3 Quality Assurance		Regulations: -	
International Convention for the Sa inspected, representatives of the Ad	articular type are required by Chapter III of the afety of Life at Sea, 1974, as amended, to be dministration should make random inspections	Quality Assurance Standard Used: -	
of manufacturers to ensure that the quality of life-saving appliances and materials used comply with the specification of the approved prototype life-saving appliance. Manufacturers should be required to institute a quality control procedure to ensure that life-saving appliances are provided to the same standard as the prototype life-saving appliance approved by the Administration and to keep records of any production tests carried out in accordance with the Administration's instructions.		Quality Assurance Procedure: -	
		Quality Assurance Manual: -	
		Description of System.	
		Quality Assurance System acceptable Yes/No	
		Comments/Observations	

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	Manufacturer:	Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.2.4 Visual Inspection	Regulations: LSA Code I/1.2.2,	& II/2.3.14		
Test Procedure	Acceptance	ce Criteria	Significant Test Data	
Insulated Immersion suit should:				
be clearly marked with approval information including the Administration which approved it, date of manufacturer and any operational restrictions;			Passed	Failed
be provided with labels giving operating instructions, general information and manufacturers details as appropriate; and			Passed	Failed
be fitted with approved patches of retro- reflective material with a total area of at least 400 cm ² and with 100 cm ² on the back if the suit does not automatically turn the wearer face up according to IMO Res. 658(16).			Passed	Failed
			Comments/Observations	

	Manufacturer:	Date:	_ Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.2.4 Visual Inspection (continued) Regulations: LSA Code I/1.2.2,			& II/2.3.1. 4	
Test Procedure	Acceptance	e Criteria	Significant Test Data	
Does the immersion suit cover the whole body with the exception of the face?			Passed	Failed
Are the hands covered, or is the immersion suit equipped with permanently attached gloves?			Passed	Failed
Are their arrangements to prevent excessive free air in the legs?			Passed	Failed
Is the immersion suit of highly visible colour?			Passed	Failed
Is the immersion suit designed to be worn without a lifejacket?			Passed	Failed
If yes				
Is the immersion suit fitted with a light complying with paragraph 2.2.3?			Passed	Failed
Is the immersion suit fitted with a whistle complying with paragraph 2.2.1.8?			Passed	Failed
			Comments/Observations	

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	Manufacturer:	_ Date:	_ Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.2.5 Test subjects	Code I/2.3.1.1.5 & 2.3.1.3.14; MSC.81(70) 1/3.1.1 & 2.8.2			
Test Procedure	Acceptance Criteria			Significant Test Data
At least six able-bodied persons both male and females of the following heights and weights should be used. At least one and not more than two of the persons should be females with not more than one female in the same height range.	1.40m - 1.60m; 1 person under 60kg		nder 60kg ver 60kg nder 70kg ver 70kg nder 80kg	Male/Female Height Weight Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations
2.3.2.6 Test with a lifejacket			Regulations: LSA C	Code 2.3.1.5; MSC.81(70) 1/3.1.2
Test Procedure		Acceptano	ce Criteria	Significant Test Data
If the suit is to be worn in conjunction with a lifejacket, the lifejacket should be worn over the suit for the tests prescribed in 2.3.2.8 to 2.3.2.16.				Manufacturer of lifejacket: Type: Manufacturer of lifejacket: Type: Manufacturer of lifejacket: Type:

	Manufacture	er:	Date:	Time:
Immersion Suits (insulated)	Model:		Surveyor:	
	Lot/Serial N	umber:	Organization:	
2.3.2.7 Test clothing			Regulations: LSA Code II/2.3.1	
Test Procedure		Acceptanc	e Criteria	Significant Test Data
The test subjects should wear a staclothing consisting of				Did all test subject use the specified test clothing □ YES □ NO
 underwear (short sleeved, shother short sleeved) shirt(long sleeved) trousers(not woollen, and woollen socks) 	ort legged)			Comments/Observations
2.3.2.8 Donning test (1)		Regulations: LSA Code II/2.3.1.1.1; MSC.81(70) 1/3.1.3		
Test Procedure		Acceptance Criteria		Significant Test Data
Following a demonstration, each should be able to unpack, don an suit over their test clothing without less than 2 min. This time should time to don any associated clot lifejacket, if such is to be worn in with the suit, and the test subject able to don such lifejacket without and the suit of	ad secure the assistance in d include the thing, and a d conjunction at should be	Each test subjects should be ablimmersion suit over their test assistance in less than 2 min. Thi don any associated clothing, and in conjunction with the immersion	clothing (see 2.3.2.7) without s time should include the time to a lifejacket, if such is to be worn	Donning time normal clothing Time Pass Fail Subject No.1sec Subject No.2sec Subject No.3sec Subject No.4sec Subject No.5sec Subject No.6sec Comments/Observations

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	Manufacturer:	_ Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.2.8 Donning test (2)		Regulations: LSA Code II/2.3.1.1.1; MSC.81(70) 1/3.1.4		
Test Procedure	Acceptano	ce Criteria	Significant	Test Data
The immersion suit should be capable of being donned in a reasonable time at an ambient temperature as low as -30° C. Before the donning test the packed immersion suit should be kept in a refrigerated chamber at a temperature of -30° C for 24 h.	The test subject should be able to time.	complete this task in a reasonable	Donning time at - 30°C Time Subject No.1sec Subject No.2sec Subject No.3sec Subject No.4sec Subject No.5sec Subject No.6sec Comments/Observations	Pass Fail

	Manufactur	er:	Date:	Time:		
Immersion Suits (insulated)	Model:		Surveyor:			
	Lot/Serial N	Jumber:	Organization:			
2.3.2.9 Ergonomic Test Regulations: LSA Code II/2.3.1.3.1; MSC.			1.3.1; MSC.81(70) 1/3.1.5			
Test Procedure		Acceptano	ce Criteria	Significant	Test Data	
When wearing the immersion su subjects should be able to:	iit, the test	There should be no restriction i movement.	in walking, bending over or arm	Restriction in walking, bending	ng over or arm mo	vement:
1. Climb up and down a vertice at least 5 m in length;	cal ladder of			All the test subjects where al write:	ble to pick up a p ☐ YES	encil and □NO
2. Perform all duties association abandonment; and	ciated with			All the test subjects where a without assistance:	ble to put on the	lifejacket □NO
3. To pick up a pencil and diameter of the pencil shown mm				All the test subjects where abl associated with abandonment a rescue boat:		
				All the test subjects where ab vertical ladder of 5 meter in le		down a
					\square YES	$\square NO$
				Comments/Observations		

1 4 5 6 1 7 6			
	Manufacturer:	Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.2.10 Field of vision test Regulations: LSA Code II/2.3.1		1.3; MSC.81(70) 1/3.1.6		
Test Procedure	Acceptance Criteria		Significant Test Data		
Each test subject should be seated with the head in a fixed position, and the lateral field of vision measured.	The lateral field of vision should be	at least 120°.	Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Obs	Passed	Failed
2.3.2.11 Flotation test	Regulations: LSA Code; MSC.81(70) 1/2		31(70) 1/3.1.7		
Test Procedure	Acceptance Criteria		Significant Test Data		
With the test subject floating at rest, wearing the suit in conjunction with a lifejacket if required, the freeboard should be measured from the water surface to the nose or mouth.	The test subject should float face-up with their mouths clear of the water by at least 120mm and be stable in that position.		Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6	Mouth Freeboard =↓ ———————————————————————————————————	Nose Freeboard = ↓

Immersion Suits (insulated) Model:	er:	Surveyor:	Time:	
2.3.2.12 Righting test		Regulations: LSA Code II/2.3.3	; MSC.81(70) 1/3.1.8	
Test Procedure	Acceptano	ce Criteria	Significant Test Data	
The test subjects, in fresh water wearing either an immersion suit or an immersion suit with lifejacket, should each demonstrate that they can turn themselves from a face-down to a face-up position in not more than 5 s.	immersion suit will right the to	emonstrated that the insulated est subjects within 5 s, the test te that they can turn themselves sition in not more than 5 s.	Righting time = ≤ 5 s Passed Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations	
2.3.2.13 Water ingress and jump test	T	Regulations: LSA Code II/2.3.3	, , , 	
Test Procedure	Acceptance	ce Criteria	Significant Tes	t Data
The test subjects should pre-wet their immersion suit and then be weighed. Following a jump into the water from a height sufficient to totally immerse the body, each test subject should be weighed again. Weighing should be performed on a machine accurate to ± 100g	The difference in the combined m should not exceed 500 g.	nass of the test subject and the suit	Mass difference ≤ 500g Passed Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations	

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	Manufacturer:	Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.2.14 Jump test Regulations: LSA C		Code II/2.3.1.3.3; MSC.81(70) 1/3.1.10
Test Procedure	Acceptance Criteria	Significant Test Data
The test subjects should jump with the suit and lifejacket if required from a height of 4.5m vertically into the water. After the jump, the immersion suit should be examined for damage or dislodging, and the test subject should be questioned concerning whether the suit caused any injury to the wearer.	The immersion suit should not be damaged or disloc way. The test subject should not be injured by the suit.	dged in any Passed Failed Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations
2.3.2.15 Leak test Regulations: LSA Code II/2.3.1		Code II/2.3.1.1.1; MSC.81(70) 1/3.1.11
Test Procedure	Acceptance Criteria	Significant Test Data
The test subject should pre-wet the immersion suit and be weighed. The test subject should then be instructed to do one of the following: 1. a period of flotation in calm water of 1h; or 2. swimming for 20 min for a distance of at least 200 m The test subject should be weighed again after the task. The weighing machine should be accurate to ± 100g.	The ingress of water into the pre-wetted suit should remass of 200g.	Indicate which alternative is used. □ Alternative 1 □ Alternative 2 Water ingress ≤ 200g Passed Failed Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations

	Manufacturer:	Date:	Time:	Page 179
Immersion Suits (insulated)	Model:	Surveyor:		
	Lot/Serial Number:	Organization:		
2.3.2.16 Swimming and water emergence test		Regulations: LSA Code II/2.3.1.3.4; MSC.	81(70) 1/3.1.12	
T .				

2.3.2.16 Swimming and water emergence test		Regulations: LSA Code II/2.3.1.	.3.4; MSC.81(70)) 1/3.1.12	
Test Procedure	Acceptance Criteria		Significant Test Data		
All test subjects, each wearing a lifejacket but not the immersion suit, should attempt to swim 25 m and board a liferaft or rigid platform with its surface 300 mm above the water surface. Test subjects who successfully complete this task should also perform it wearing the immersion suit. If designed to be used with a lifejacket, then immersion suit should be tested with the subject also wearing a lifejacket.	_	d be able to board the liferaft or	Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 2) 25 m s Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.4 Subject No.5	Pass	g without lifejacket. Fail ———————————————————————————————————

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	Manufacturer:	_ Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.2.17 Oil resistance test	Regulations: LSA Code; MSC	81(70) 1/3.1.13
Test Procedure	Acceptance Criteria	Significant Test Data
After all its apertures have been sealed an immersion suit should be immersed for a period of 24 h under 100 mm head of diesel oil at normal room temperature. The surface oil should then be wiped off and the immersion suit subjected to the test prescribed in 2.3.2.16 The ingress of water should not exceed a mass of 200g.	Acceptance Criteria	Significant Test Data Indicate which alternative is used. □Alternative 1 □Alternative 2 Water ingress ≤ 200g Pass Fail Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations

	_ Time:	Date:	Manufacturer:	
		Surveyor:	Model:	Immersion Suits (insulated)
<u> </u>		Organization:	Lot/Serial Number:	
_		Organization:	Lot/Serial Number:	

		-	
2.3.2.18 Alternative Oil resistance test		Regulations: LSA Code; MSC	C.81(70) 1/3.1.14
Test Procedure	Acceptance	Criteria	Significant Test Data
In lieu of the test for oil resistance prescribed in 2.3.2.17 either of the following tests may be conducted. After all apertures have been sealed, the immersion suit should be immersed for a period of 24 h under 100 mm head of diesel oil at normal room temperature if necessary using weights to keep suit submerged. Any surface oil should then be wiped off and the immersion suit turned inside out. The suit should then be laid on a table suitable for collecting and draining off any leakage and be supported at the neck aperture by a suitable designed hanger. The suit should then be filled with water to neck level which should be 300mm above the table	After 1h in this position there shoul mass of 200g	d be no leakage exceeding a	Indicate which alternative is used. □ Alternative 1 □ Alternative 2 Water ingress ≤ 200g Pass Fail Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Strength > 150N Pass Fail
Representative samples of the exterior fabric and seams should be immersed under 100mm head of diesel oil for 24 h. After removal from the oil the samples should be wiped off before being subjected to the following tests: - 1. a hydrostatic test of a 1m water head and 2. a tensile test of representative seams	The samples should successfully su The seam strength should be not les		The samples should support a 1 m head of water Pass Fail Comments/Observations

1 450 102	Manufacturer:	Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	_ Organization:	

2.3.2.19 Fire test	Regulations: LSA Code II/2.3.1.	Regulations: LSA Code II/2.3.1.1.2; MSC.81(70) 1/3.1.15		
Test Procedure	Acceptance Criteria	Significant Test Data		
A test pan 30x35x6cm should be placed in an essentially draught-free area. Water should be put in the bottom of the test pan to make a minimum total depth of 1 cm followed by enough petrol to make a minimum dept of 4 cm. The petrol should then be ignited and allowed	The immersion suit should not sustain burning or continue melting after being removed from exposure to the flames.	Did the immersion suit continue to burn or continue melting after being removed from the flames?		
to burn freely for 30 s. If necessary the immersion suit should be draped over a hanger to ensure the whole of the suit is enveloped in the flames, with the bottom of the suit 25 cm above the top edge of the test pan so that the duration of exposure to the flames is 2 s.		Comments/Observations		

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	Manufacturer:	Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2.3.2.20 Temperature cycling test		Regulations: LSA Code I/1.2.1.	2; MSC.81(70) 1/3.1.16
Test Procedure		Acceptance Criteria	Significant Test Data

2.3.2.20 Temperature cycling test	Regulations: LSA Code I/1	2.1.2; MSC.81(70) 1/3.1.16
Test Procedure	Acceptance Criteria	Significant Test Data
The following test should be carried out on two immersion suits The immersion suits should be alternately subjected to surrounding temperatures of -30°C and +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of 10 cycles, is acceptable: 1 an 8 h cycle at +65°C to be completed in one day; and 2 the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions until the next day; 3 an 8 h cycle at -30°C to be completed the next day; and 4 the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions until the next day.	The immersion suits material should show no signs of damage s as shrinking, swelling dissolution or changes of mechar qualities.	uch (See following page for test data)

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	Manufacturer:	_ Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.2.21	Temperature cycling test - Test data		Regulations: LSA Code I/1.2.1.2; MSC.81(70) 1/3	3.1.16
	НС	OT CYCLE	COLD CYCLE	
Cycle 1	Date In: Time In : Temperature : C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration : hours
Cycle 2	Date In: Time In : Temperature : C	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration : hours
Cycle 3	Date In:	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration : hours
Cycle 4	Date In:	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration : hours
Cycle 5	Date In:	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration : hours
Cycle 6	Date In:	Date Out:	Date In:	Date Out: Time Out: Duration : hours
Cycle 7	Date In:	Date Out:	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration : hours
Cycle 8	Date In:	Date Out: Time Out:hours	Date In: Time In : Temperature : 0 C	Date Out: Time Out: Duration :hours
Cycle 9	Date In: Time In: Temperature:^0C	Date Out: Time Out:hours	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 10	Date In: Time In: Temperature: 0C	Date Out: hours	Date In:	Date Out: Time Out: Duration : hours

Immersion Suits (insulated) Model:_	l Number:	Surveyor:	.4; MSC.81(70) 1/3.1.17 Significant Test Data	
1		buoyancy and the final buoyancy	Buoyancy 1 Buoyancy 2 % differencekg% Passed Failed Comments/Observations	
2.3.2.23 Strength test		Regulations: LSA Code; MSC.	81(70) 1/3.1.18	
Test Procedure	Acceptano	ce Criteria	Significant Test Data	
The immersion suit should be immersed water for a period of 2 min. The immersion suclosed in the same manner as when worn by person, a force of not less than 1350N should applied for 30 min to the part of the immersion suit that secures it to the body of the wearer. Yoke or over-the-head type lifejacket The immersion suit may be cut if necessary	a ee n	damaged as a result of this test.	Passed Failed Comments/Observations	
The immersion suit may be cut if necessary accommodate to the test device.	0			

ruge 100			
	Manufacturer:	_ Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.2.24 Thermal protective test (General)	Regulations: LSA Code II/2.3.	2.1; MSC.81(70) 1/3.2.1 – 3.2.4
Test Procedure	Acceptance Criteria	Significant Test Data
The thermal protective qualities may be measured using a thermal manikin, when such a method is required by an Administration and has been demonstrated to provide test results which correlate satisfactorily in all aspects to test results using human subjects.		
If human subjects are used, they should be medically examined before being accepted for the tests. Each design of immersion suit is to be tested by test subjects specified in 2.3.2.5.		
Where human subjects are used, the tests should always be conducted under the supervision of physician. Emergency resuscitation equipment should be available during all tests. For safety reasons, ECG should be monitored during every test. Testing should be stopped at the wish of the test subjects, if the falling rate of the core temperature is more than 1.5° C per hour after the first half hour, if the skin temperature of the hand, foot or lumbar region should fall below 10° C, or if the attending physician considers it advisable.		Comments/Observations
When testing with human subjects, continuous body core temperature (rectal temperature) and skin temperature of lumbar region, both hands, calves, foot (foot instep) and heels, should be measured. The accuracy of the measuring system should be 0.2°C. Appropriate corresponding measurements should be taken if a manikin is used in lieu of human subjects.		

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	Manufactur	er:	Date:	Time:
Immersion Suits (insulated)	Model:		Surveyor:	
		Jumber:	•	
	Low Schai N	duniber	Organization	
2.3.2.25 Thermal Protective te	st (Continued)		Regulations: LSA Code II/2.3.2.1.2	2; MSC.81(70) 1/3.2.9, 3.2.11 & 7 .12
Test Procedure		Acceptano	ce Criteria	Significant Test Data
Prior to tests, the same amour resulting from the water ingress a in paragraph 2.3.2.13 should be podry suit worn over the dry to specified in 2.3.2.7 by the test states.	and jump test tured into the est clothing	Following immersion each test should not fall more than 2°C subject's temperature.	subject's body core temperature below the normal level of the	Same mass of water which was the result from test 2.3.2.13, should be poured into the immersion suit Beginning End normal of test of test temperature Subject No 1 Subject No.2
down. Each test subject wearing an impreviously subjected to the juparagraph 2.3.2.14. Following a 6 immersion, with hands gloved, in calm water at between 0°C and +2 subject's body core temperature shore than 2°C below the normal	mp test in 6 h period of n circulating °C, each test could not fall			Subject No.3 Subject No.4 Subject No.5 Subject No.6 Passed Failed Pick up a pencil and write after 1 h period of immersion: Subject No 1
subject's temperature. The immersion suit should provisive thermal protection to ensure that on leaving the water after a 1 immersion, with gloved hands circulating at +5°C each test subjup a pencil as specified in paragrap write.	immediately hr period of s, in water ject can pick h 2.3.2.9 and	The test subjects should be able to	pick up a pencil and write.	Subject No 3
Alternatively, at the manufacturers ability to pick up a pencil and write in paragraph 2.3.2.9 above demonstrated immediately after water upon completion of the above	e as specified may be leaving the			Subject No 6

Tage 100	Manufacturer:	_ Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.3.2.26 Te	st sheets for temperatures	during immersion tests	Regulations: LSA Code II/2	2.3.2.1.2; MSC.81(70) 1/3.	2.9, 3.2.11 & 7 .12	
Subject 1	Rectal temp after 1 hr:Skin temp at lumbar region after 1 hr:Skin temp at left hand after 1 hr:Skin temp at right hand after 1 hr:Skin temp at calves after 1 hr:Skin temp at left foot (foot instep) after 1 hr:Skin temp at right foot (foot instep) after 1 hr:Skin temp at left heel after 1 hr:Skin temp at left heel after 1 hr:	Rectal temp after 2 hr:Skin temp at lumbar region after 2 hr:Skin temp at left hand after 2 hr:Skin temp at right hand after 2 hr:Skin temp at calves after 2 hr:Skin temp at left foot(foot instep) after 2 hr:Skin temp at right foot(foot instep) after 2 hr:Skin temp at left heel after 2 r:Skin temp at left heel after 2 r:	Rectal temp after 3 hr:Skin temp at lumbar region after 3 hr :Skin temp at left hand after 3 hr:Skin temp at right hand after 3 hr:Skin temp at calves after 3 hr:Skin temp at left foot(foot instep) after 3 hr:Skin temp at right foot(foot instep) after 3 hr:Skin temp at left heel after 3 hr:Skin temp at left heel after 3 hr:Skin temp at left heel after 3 hr:	Rectal temp after 4 hr:Skin temp at lumbar region after 4 hr:Skin temp at left hand after 4 hr:Skin temp at right hand after 4 hr:Skin temp at calves after 4 hr:Skin temp at left foot(foot instep) after 4 hr:Skin temp at right foot(foot instep) after 4 hr:Skin temp at left heel after 4 hr:Skin temp at left heel after 4 hr:	Rectal temp after 5 hr:Skin temp at lumbar region after 5 hr :Skin temp at left hand after 5 hr:Skin temp at right hand after 5 hr:Skin temp at calves after 5 hr:Skin temp at left foot(foot instep) after 5 hr:Skin temp at right foot(foot instep) after 5 hr:Skin temp at left heel after 5 hr:Skin temp at left heel after 5 hr:Skin temp at left heel after 5 hr:	Rectal temp after 6 hr: Skin temp at lumbar region after 6 hr: Skin temp at left hand after 6 hr: Skin temp at right hand after 6 hr: Skin temp at calves after 6 hr: Skin temp at left foot(foot instep) after 6 hr: Skin temp at right foot(foot instep) after 6 hr: Skin temp at left heel after 6 hr:
Subject 2	Rectal temp after 1 hr:Skin temp at lumbar region after 1 hr:Skin temp at left hand after 1 hr:Skin temp at right hand after 1 hr:Skin temp at calves after 1 hr:Skin temp at left foot (foot instep) after 1 hr:Skin temp at right foot (foot instep) after 1 hr:Skin temp at left heel after 1 hr:Skin temp at left heel after 1 hr:	Rectal temp after 2 hr:	Rectal temp after 3 hr:Skin temp at lumbar region after 3 hr:Skin temp at left hand after 3 hr:Skin temp at right hand after 3 hr:Skin temp at calves after 3 hr:Skin temp at left foot(foot instep) after 3 hr:Skin temp at right foot(foot instep) after 3 hr:Skin temp at right foot(foot instep) after 3 hr:Skin temp at left heel after 3 hr:Skin temp at left heel after 3 hr:	Rectal temp after 4 hr:_ Skin temp at lumbar region after 4 hr :_ Skin temp at left hand after 4 hr:_ Skin temp at right hand after 4 hr:_ Skin temp at calves after 4 hr:_ Skin temp at left foot(foot instep) after 4 hr:_ Skin temp at right foot(foot instep) after 4 hr:_ Skin temp at left heel after 4 hr:_ Skin temp at left heel after 4 hr:_	Rectal temp after 5 hr:Skin temp at lumbar region after 5 hr :Skin temp at left hand after 5 hr:Skin temp at right hand after 5 hr:Skin temp at calves after 5 hr:Skin temp at left foot(foot instep) after 5 hr:Skin temp at right foot(foot instep) after 5 hr:Skin temp at left heel after 5 hr:	Rectal temp after 6 hr:Skin temp at lumbar region after 6 hr :Skin temp at left hand after 6 hr:Skin temp at right hand after 6 hr:Skin temp at calves after 6 hr:Skin temp at left foot(foot instep) after 6 hr:Skin temp at right foot(foot instep) after 6 hr:Skin temp at left heel after 6 hr:Skin temp at left heel after 6 hr:Skin temp at left heel after 6 hr:

	Manufacturer:	Date:	_ Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

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II	est sheets for temperature continued)	s during immersion tests	Regulations: LSA Code II/2	2.3.2.1.2; MSC.81(70) 1/3.	2.9 & 3.2.11 7 .12	
Subject 3	Rectal temp after 1 hr:Skin temp at lumbar region after 1 hr:Skin temp at left hand after 1 hr:Skin temp at right hand after 1 hr:Skin temp at calves after 1 hr:Skin temp at left foot (foot instep) after 1 hr:Skin temp at right foot (foot instep) after 1 hr:Skin temp at left heel after 1 hr:Skin temp at left heel after 1 hr:	Rectal temp after 2 hr:	Rectal temp after 3 hr:Skin temp at lumbar region after 3 hr:Skin temp at left hand after 3 hr:Skin temp at right hand after 3 hr:Skin temp at calves after 3 hr:Skin temp at left foot(foot instep) after 3 hr:Skin temp at right foot(foot instep) after 3 hr:Skin temp at right foot(foot instep) after 3 hr:Skin temp at left heel after 3 hr:Skin temp at left heel after 3 hr:	Rectal temp after 4 hr:Skin temp at lumbar region after 4 hr:Skin temp at left hand after 4 hr:Skin temp at right hand after 4 hr:Skin temp at calves after 4 hr:Skin temp at left foot(foot instep) after 4 hr:Skin temp at right foot(foot instep) after 4 hr:Skin temp at right foot(foot instep) after 4 hr:Skin temp at left heel after 4 hr:Skin temp at left heel after 4 hr:	Rectal temp after 5 hr:Skin temp at lumbar region after 5 hr :Skin temp at left hand after 5 hr:Skin temp at right hand after 5 hr:Skin temp at calves after 5 hr:Skin temp at left foot(foot instep) after 5 hr:Skin temp at right foot(foot instep) after 5 hr:Skin temp at right foot(foot instep) after 5 hr:Skin temp at left heel after 5 hr:Skin temp at left heel after 5 hr:	Rectal temp after 6 hr:Skin temp at lumbar region after 6 hr:Skin temp at left hand after 6 hr:Skin temp at right hand after 6 hr:Skin temp at calves after 6 hr:Skin temp at left foot(foot instep) after 6 hr:Skin temp at left foot(foot instep) after 6 hr:Skin temp at right foot(foot instep) after 6 hr:Skin temp at left heel after 6 hr:Skin temp at left heel after 6 hr:
Subject 4	Rectal temp after 1 hr:	Rectal temp after 2 hr:	Rectal temp after 3 hr:Skin temp at lumbar region after 3 hr:Skin temp at left hand after 3 hr:Skin temp at right hand after 3 hr:Skin temp at calves after 3 hr:Skin temp at left foot(foot instep) after 3 hr:Skin temp at right foot(foot instep) after 3 hr:Skin temp at right foot(foot instep) after 3 hr:Skin temp at left heel after 3 hr:Skin temp at left heel after 3 hr:	Rectal temp after 4 hr:Skin temp at lumbar region after 4 hr:Skin temp at left hand after 4 hr:Skin temp at right hand after 4 hr:Skin temp at calves after 4 hr:Skin temp at left foot(foot instep) after 4 hr:Skin temp at right foot(foot instep) after 4 hr:Skin temp at left heel after 4 hr:Skin temp at left heel after 4 hr:Skin temp at left heel after 4 hr:	Rectal temp after 5 hr:Skin temp at lumbar region after 5 hr:Skin temp at left hand after 5 hr:Skin temp at right hand after 5 hr:Skin temp at calves after 5 hr:Skin temp at left foot(foot instep) after 5 hr:Skin temp at right foot(foot instep) after 5 hr:Skin temp at right foot(foot instep) after 5 hr:Skin temp at left heel after 5 hr:Skin temp at left heel after 5 hr:	Rectal temp after 6 hr:Skin temp at lumbar region after 6 hr:Skin temp at left hand after 6 hr:Skin temp at right hand after 6 hr:Skin temp at calves after 6 hr:Skin temp at left foot(foot instep) after 6 hr:Skin temp at right foot(foot instep) after 6 hr:Skin temp at right foot(foot instep) after 6 hr:Skin temp at left heel after 6 hr:Skin temp at left heel after 6 hr:Skin temp at left heel after 6 hr:

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	Manufacturer:	Date:	Time:
Immersion Suits (insulated)	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

	st sheets for temperatures ontinued)	during immersion tests	Regulations: LSA Code II/2	2.3.2.1.2; MSC.81(70) 1/3.	2.9 & 3.2.11 7 .12	
Subject 5	Rectal temp after 1 hr:Skin temp at lumbar region after 1 hr:Skin temp at left hand after 1 hr:Skin temp at right hand after 1 hr:Skin temp at calves after 1 hr:Skin temp at left foot (foot instep) after 1 hr:Skin temp at right foot (foot instep) after 1 hr:Skin temp at left heel after 1 hr:Skin temp at left heel after 1 hr:	Rectal temp after 2 hr:Skin temp at lumbar region after 2 hr:Skin temp at left hand after 2 hr:Skin temp at right hand after 2 hr:Skin temp at calves after 2 hr:Skin temp at left foot(foot instep) after 2 hr:Skin temp at right foot(foot instep) after 2 hr:Skin temp at right foot(foot instep) after 2 hr:Skin temp at left heel after 2 r:	Rectal temp after 3 hr:Skin temp at lumbar region after 3 hr:Skin temp at left hand after 3 hr:Skin temp at right hand after 3 hr:Skin temp at calves after 3 hr:Skin temp at left foot(foot instep) after 3 hr:Skin temp at right foot(foot instep) after 3 hr:Skin temp at right foot(foot instep) after 3 hr:Skin temp at left heel after 3 hr:	Rectal temp after 4 hr:Skin temp at lumbar region after 4 hr:Skin temp at left hand after 4 hr:Skin temp at right hand after 4 hr:Skin temp at calves after 4 hr:Skin temp at left foot(foot instep) after 4 hr:Skin temp at right foot(foot instep) after 4 hr:Skin temp at left heel after 4 hr:Skin temp at left heel after 4 hr:	Rectal temp after 5 hr: Skin temp at lumbar region after 5 hr : Skin temp at left hand after 5 hr: Skin temp at right hand after 5 hr: Skin temp at calves after 5 hr: Skin temp at left foot(foot instep) after 5 hr:_ Skin temp at left foot(foot instep) after 5 hr:_ Skin temp at right foot(foot instep) after 5 hr:_ Skin temp at left heel after 5 hr: Skin temp at left h	Rectal temp after 6 hr:Skin temp at lumbar region after 6 hr:Skin temp at left hand after 6 hr:Skin temp at right hand after 6 hr:Skin temp at calves after 6 hr:Skin temp at left foot(foot instep) after 6 hr:Skin temp at right foot(foot instep) after 6 hr:Skin temp at right foot(foot instep) after 6 hr:Skin temp at left heel afte
Subject 6	Rectal temp after 1 hr:	Rectal temp after 2 hr:Skin temp at lumbar region after 2 hr:Skin temp at left hand after 2 hr:Skin temp at right hand after 2 hr:Skin temp at calves after 2 hr:Skin temp at left foot(foot instep) after 2 hr:Skin temp at right foot(foot instep) after 2 hr:Skin temp at left heel after 2 hr:Skin temp at left heel after 2 hr:	Rectal temp after 3 hr:Skin temp at lumbar region after 3 hr:Skin temp at left hand after 3 hr:Skin temp at right hand after 3 hr:Skin temp at calves after 3 hr:Skin temp at left foot(foot instep) after 3 hr:Skin temp at right foot(foot instep) after 3 hr:Skin temp at right foot(foot instep) after 3 hr:Skin temp at left heel after 3 hr:Skin temp at left heel after 3 hr:Skin temp at left heel after 3 hr:	Rectal temp after 4 hr:Skin temp at lumbar region after 4 hr:Skin temp at left hand after 4 hr:Skin temp at right hand after 4 hr:Skin temp at calves after 4 hr:Skin temp at left foot(foot instep) after 4 hr:Skin temp at right foot(foot instep) after 4 hr:Skin temp at left heel after 4 hr:Skin temp at left heel after 4 hr:Skin temp at left heel after 4 hr:	Rectal temp after 5 hr:Skin temp at lumbar region after 5 hr :Skin temp at left hand after 5 hr:Skin temp at right hand after 5 hr:Skin temp at calves after 5 hr:Skin temp at left foot(foot instep) after 5 hr:Skin temp at right foot(foot instep) after 5 hr:Skin temp at right foot(foot instep) after 5 hr:Skin temp at left heel after 5 hr:Skin temp at left heel after 5 hr:	Rectal temp after 6 hr:Skin temp at lumbar region after 6 hr:Skin temp at left hand after 6 hr:Skin temp at right hand after 6 hr:Skin temp at calves after 6 hr:Skin temp at left foot(foot instep) after 6 hr:Skin temp at right foot(foot instep) after 6 hr:Skin temp at right foot(foot instep) after 6 hr:Skin temp at left heel after

2.4 ANTI -EXPOSURE SUITS

EVALUATION AND TEST REPORT

2.4.1	General data and specifications
2.4.2	Submitted drawings, reports and documents
2.4.3	Quality assurance
2.4.4	Visual inspection
2.4.5	Test subjects
2.4.6	Test with a lifejacket
2.4.7	Test clothing
2.4.8	Donning tests 1 & 2
2.4.9	Ergonomic test
2.4.10	Field of vision test
2.4.11	Flotation test
2.4.12	Righting test
2.4.13	Water ingress and jump test
2.4.14	Jump test
2.4.15	Leak test
2.4.16	Swimming and water emergency test
2.4.17	Oil resistance test
2.4.18	Alternative Oil resistance test
2.4.19	Fire test
2.4.20	Temperature cycling test
2.4.21	Temperature cycling test - Test data
2.4.22	Buoyancy test
2.4.23	Strength test
2.4.24	Thermal protective test (General)
2.4.25	Thermal protective test (Continued)
2.4.26	Test sheets for temperatures during immersion tests

2.4 ANTI -EXPOSURE SUITS

EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

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	Manufactur	er:		Date:	T	ime:
Anti-Exposure suits	Model:			Surveyor:		
	Lot/Serial N	Jumber:		Organization:		
2.4.2 General Data and S	pecifications		T	ons: LSA Code 2.3; M		
Construction Material:		Additional equipment:			Donning instructio	ns:
Fabric produced by:		Retro reflective material:	□ YES	□ NO	□YES	□ NO
Туре:		Whistle produced:	□YES	□ NO		
Buoyant material		Life-line:	□YES	□ NO		
produced by:		Light:	□ YES	□ NO		
Type:						

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	Manufacturer	:	Date:	Time:	
Anti-Exposure suits	Model:		Surveyor:		
	Lot/Serial Nu	mber:	Organization:		
2.4.2 Submitted	l drawings, reports and o	locuments			
		Submitted drawings	and documents		Status
Drawing No.	Revision No. & date		Title of drawing		
					·
		Submitted reports a	and documents		Status
Report/Document No.	Revision No. & Date		Title of report / document		
		Maintenance Manual -			
		Operations Manual -			
		1			

	Manufacturer:	Date:	Time:
Anti-Exposu	re suits Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2.4.3	Quality Assurance	Regulations: -	
International inspected, re of manufactured comply Manufactured that life-saving applia	e all appliances of a particular type are required by Chapter III of the Convention for the Safety of Life at Sea, 1974, as amended, to be presentatives of the Administration should make random inspections are to ensure that the quality of life-saving appliances and materials with the specification of the approved prototype life-saving appliance. It is should be required to institute a quality control procedure to ensure agaphiances are provided to the same standard as the prototype life-ince approved by the Administration and to keep records of any sets carried out in accordance with the Administration's instructions.	Quality Assurance Standard Used:	

1 450 170			
	Manufacturer:	Date:	
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.4.4 Visual Inspection		Regulations: LSA Code I/1.2.2, II/2.3.1.1.3 & 2.3.1.1.4			
Test Procedure	Test Procedure Acceptance		Significant Test Data		
Anti-Exposure suit should:					
Be clearly marked with approval information including the Administration which approved it, date of manufacturer and any operational restrictions			Passed	Failed	
Be provided with labels giving servicing details and intervals between servicing, operating instructions, general information and manufacturers details.			Passed	Failed	
Be fitted with approved patches of retro- reflective material with a total area of at least 400 cm ² and with 100 cm ² on the back if the suit does not automatically turn the wearer face up according to IMO Res. 658(16).			Passed Comments/Observations	Failed	

			Page 1
	Manufacturer:	Date:	Time:
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2.4.4 Visual Inspec	ction (continued)	Regulations: LSA Code I/1.2.2,	II/2.3.1.4 & 2.3.1.6
Test Proced	ure	Acceptance Criteria	Significant Test Data

2.4.4 Visual Inspection (continued)	2.4.4 Visual Inspection (continued) Regulations: LSA Code			
Test Procedure	Acceptanc	e Criteria	Significant Test Data	
Does the Anti-Exposure suit cover the whole body with the exception of the face? Is the Anti-Exposure suit equipped with permanently attached gloves?			Passed	Failed
Are their arrangements to prevent excessive free air in the legs?			Passed	Failed
Is the Anti-Exposure suit of highly visible colour?			Passed	Failed
Is the Anti-Exposure suit designed to be worn without a lifejacket?			□YES □	NO
If yes				
Is the Anti-Exposure suit fitted with a light complying with paragraph 2.2.3?			Passed	Failed
Is the Anti-Exposure suit fitted with a whistle complying with paragraph 2.2.1.8?			Passed	Failed
Is the Anti-Exposure suit specified as must be worn in conjunction with a lifejacket?			Passed	Failed
Is the anti-exposure suit equipped with a pocket for a portable VHF telephone?			Passed Comments/Observation	Failedons

1 age 170	Manufacturer:	_ Date:	_ Time:
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.4.5 Test subjects			Regulations: LSA C	Code II/2.3.1.1.5 & 2.3.1.3.14; MSC.81(70) 1/3.1.1 & 2.8.2		
Test Procedure	Acceptance		ce Criteria	Significant Test Data		
At least six able-bodied persons both male and females of the following heights and weights should be used. At least one and not more than two of the persons should be females with not more than one female in the same height range.	Height 1.40m - 1.60m; 1.60m - 1.80m over 1.80m	Weig 1 person us 1 person us 1 person os 1 person us 1 person us 1 person us 1 person os	nder 60kg ver 60kg nder 70kg ver 70kg nder 80kg	Male/Female Height Weight Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations		
2.4.6 Test with a lifejacket			Regulations: LSA Code II/2.3.1.5; MSC.81(70) 1/3.1.2			
Test Procedure		Acceptance	ce Criteria	Significant Test Data		
If the Anti-Exposure suit is to be worn in conjunction with a lifejacket, the lifejacket should be worn over the anti - exposure suit for the tests prescribed in 2.4.8 to 2.4.16.				Manufacturer of lifejacket: Type: Manufacturer of lifejacket: Type: Manufacturer of lifejacket: Type: Comments/Observations		

N	Manufacturer:	Date:	Time:
Anti-Exposure suits	Model:	Surveyor:	
I	.ot/Serial Number:	Organization:	
2.4.7 Test clothing		Regulations: LSA Code II/2.3.1	
Test Procedure	Acceptar	nce Criteria	Significant Test Data
The test subjects should wear a stand clothing consisting of 1 underwear (short sleeved, short l			Did all test subject use the specified test clothing □ YES □ NO
 underwear (short sleeved, short l shirt(long sleeved) trousers(not woollen, and woollen socks 	egged)		Comments/Observations
2.4.8 Donning test (1)	<u> </u>	Regulations: LSA Code II/2.3.1	.1.1; MSC.81(70) 1/3.1.3
Test Procedure	Acceptar	nce Criteria	Significant Test Data
It can be unpacked and donned assistance within 2 min, taking into acclothing 2.4.7 and a lifejacket if Exposure suit is to be worn in conjunct a lifejacket	the Anti- ction with unpack, don and secure the a clothing (see 2.4.7) without assistant should include the time to do	e test subjects should be able to anti-exposure suit over their test stance in less than 2 min. This time in any associated clothing, and a rin in conjunction with the Anti-	Donning time with normal clothing Time Pass Fail Subject No.1 sec Subject No.2 sec Subject No.3 sec Subject No.4 sec Subject No.5 sec Subject No.6 sec Comments/Observations

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	Manufacturer:	_ Date:	_ Time:
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.4.8 Donning test (2)		Regulations: LSA Code I/1.2.2.3; MSC.81(70) 1/3.1.4				
Test Procedure	Acceptance	ce Criteria	Significant Test Data			
The test subjects should be able to unpack and don the anti-exposure suit in ambient temperature of -30° C. Before the donning test the Anti-Exposure suit should be kept in a refrigerated chamber at a temperature of -30°C for 24 h.	The test subject should be able to time.	o complete this task a reasonable	Donning time at - 30 Time Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observat	sec sec sec sec sec sec sec		

								Page 20
		Manufactur	er:	Date:		Time:		
Anti-	Exposure suits	Model:		Surveyor:				
		Lot/Serial N	Number:	Organization:				
				T				
2.4.9	Ergonomic Test			Regulations: LSA Code II/2	.3.1.3.1; MSC.81(70)	1/3.1.5		
	Test Procedure		Acceptano	ce Criteria		Significant Test Da	ıta	
	n wearing the Anti-Exposure sects should be able to:	suit, the test	There should be no restriction is movement. The diameter of the pe	<u> </u>	rm Restriction in w	ralking, bending over		ement:
1.	Climb up and down a verticat least 5 m in length;	cal ladder of			All the test sub write:	jects where able to p		ncil and □NO
2.	Perform all duties associabandonment; and	ciated with			All the test sub without assistan	jects where able to juce:		fejacket □NO
3.	To pick up a pencil and diameter of the pencil show					ects where able to pe abandonment, assist	others and o	
						ects where able to cli of 5 meter in length:	mb up and d	own a
						\Box YE	S	$\square NO$
					Comments/Obse	ervations		

1 agc 202			
	Manufacturer:	_ Date:	Time:
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.4.10 Field of vision test		Regulations: LSA Code II/2	2.3.1.1.3; MSC.8	81(70) 1/3.1.0	6		
Test Procedure	Acceptance	Criteria	Significant Test Data				
Each test subject should be seated with the head in a fixed position, and the lateral field of vision measured.	The lateral field of vision should b	e at least 120°.	Field of vision angle = 120° Angle(degs.) Pass Fail Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations		il 		
2.4.11 Flotation test		Regulations: LSA Code; M	ISC.81(70) 1/3.1	.7			
Test Procedure	Acceptance (Criteria	Significant Test Data				
	When wearing the Anti-Exposure suit, lifejacket if required, the test subject shot their mouths clear of the water by at stable in that position. The freeboard shot the water surface to the nose and mouth rest. The freeboard of the anti-expositiejacket should be at least 50 mm.		Freeboard Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Obs	(mm)	Nose (mm)		Nose (mm)

							Page 203
	Manufacture	er:	Date:		Time:		
Anti-Exposure suits	Model:		Surveyor:				
	Lot/Serial N	Number:	Organization:				
				3.500.04(70).440	4.0		
2.4.12 Righting test		Τ	Regulations: LSA Code II/2.4.3	3; MSC.81(70) 1/3.			
Test Procedure		Acceptano	ce Criteria		Significant Te	est Data	
		Except where it has been demons will right the test subjects within	strated that the anti-exposure suit 5 s.	Righting time = ≤ 5 s Time (s) Pass Fail Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations		Fail	
2.4.13 Water ingress and ju	ump test		Regulations: LSA Code II/2.3.3	3; MSC.81(70) 1/3	.1.9		
Test Procedure		Acceptano	ce Criteria		Significant Te	est Data	
The test subjects should pre-wet Exposure suit and then be weighed. jump into the water from a height stotally immerse the body, each should be weighed again. Weighing should be performed on accurate to ± 100g	Following a sufficient to test subject	The difference in the combined m should not exceed 500 g.	ass of the test subject and the suit	Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Obse	Pass		

r age 204	Manufacturer:	Date:	_ Time:
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.4.14 Jump test		Regulations: LSA Code II/2.3.1.3.3; MSC.81(70) 1/3.1.10		
Test Procedure	Acceptance	e Criteria	Significant Test Data	
The test subjects should jump with the Anti-Exposure suit and lifejacket if required from a height of 4.5m vertically into the water. After the jump, the Anti - Exposure suit should be examined for damage or dislodging, and the test subject should be questioned concerning whether the suit caused any injury to the wearer.	The Anti - Exposure suit should not be damaged or dislodged is any way. The test subject should not be injured by the suit. The light, if fitted, should not injure the test subject.		Pass Fail Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations	
2.4.15 Leak test	Regulations: LSA Code II/2.3.1		.1.1; MSC.81(70) 1/3.1.11	
Test Procedure	Acceptance	e Criteria	Significant Test Data	
The test subject should pre-wet the Anti - Exposure suit and be weighed. The test subject should then be instructed to do one of the following: 1. a period of flotation in calm water of 1h; or 2. swimming for 20 min for a distance of at least 200 m The test subject should be weighed again after the task. The weighing machine should be accurate to ± 100g.	The ingress of water into the premass of 200g.	-wetted suit should not exceed a	Indicate which alternative is used. □ Alternative 1 □ Alternative 2 Water ingress ≤ 200g Pass Fail Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations	

Manufacture	er:	Date:		_ Time:	
Model:		Surveyor:			
Lot/Serial N	umber:	Organization:			
water emergent to	est	Regulations: LSA Code II/2.3.1	.3.4; MSC.81(70)	1/3.1.12	
re	Acceptance	ce Criteria		Significant Te	est Data
ag a lifejacket but should attempt to	2		1) 25m swim a	and boarding w	rithout lifejacket.
above the water			Subject No.1 Subject No.2 Subject No.3		Fail
lly complete this wearing the Anti-			Subject No.4 Subject No.5 Subject No.6		
a lifejacket, then e tested with the et.			2) 25 m swim		
			Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6		
1	Model:Lot/Serial N water emergent to e g a lifejacket but should attempt to t or rigid platform above the water ly complete this vearing the Anti- a lifejacket, then tested with the	Model:	Model:	Model:	Model:

rage 200			
	Manufacturer:	Date:	Time:
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.4.17 Oil resistance test		Regulations: LSA Code; MSC.81(70) 1/3.1.13		
Test Procedure	Acceptano	ce Criteria	Significant Test Data	
After all its apertures have been sealed an Anti-Exposure suit should be immersed for a period of 24 h under 100 mm head of diesel oil at normal room temperature. The surface oil should then be wiped off and the suit subjected to the test prescribed in 2.4.16	The ingress of water should not ex-	xceed a mass of 200g.	Indicate which alternative is used. □ Alternative 1 □ Alternative 2 Water ingress ≤ 200g Pass Fail Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations	

				Page 207
	Manufacture	r:	Date:	Time:
Anti-Exposure suits	Model:		Surveyor:	
	Lot/Serial N	umber:	Organization:	
2.4.18 Alternative oil resistance test		Regulations: LSA Code; MSC.	81(70) 1/3.1.14	
Test Procedure Ac		Acceptance	ce Criteria	Significant Test Data

2.4.18 Alternative oil resistance test	Regulations: LSA	Regulations: LSA Code; MSC.81(70) 1/3.1.14		
Test Procedure	Acceptance Criteria	Significant Test Data		
In lieu of the test for oil resistance prescribed in 2.4.17 either of the following tests may be conducted. After all apertures have been sealed, the antiexposure suit should be immersed for a period of 24 h under 100 mm head of diesel oil at normal room temperature if necessary using weights to keep suit submerged. Any surface oil should then be wiped off and the anti-exposure suit turned inside out. The suit should then be laid on a table suitable for collecting and draining off any leakage and be supported at the neck aperture by a suitable designed hanger. The suit should then be filled with water to neck level which should be 300mm above the table Representative samples of the exterior fabric and seams should be immersed under 100mm head of diesel oil for 24 h. After removal from the oil the samples should be wiped off before being subjected to the following tests: - 1. a hydrostatic test of a 1m water head and 2. a tensile test of representative seams	After 1h in this position there should be no leakage excemass of 200g The samples should successfully support 1 m head of w. The seam strength should be not less than 150 N	Indicate which alternative is used. □ Alternative 1 □ Alternative 2 Water ingress ≤ 200g Pass Fail Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6		

1 uge 200			
	Manufacturer:	Date:	
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.4.19 Fire test	Regulations: LSA Code II/2.3.1			
Test Procedure	Acceptance Criteria		Significant Test Data	
A test pan 30x35x6cm should be placed in an essentially draught-free area. Water should be put in the bottom of the test pan to make a minimum total depth of 1 cm followed by enough petrol to make a minimum dept of 4 cm. The petrol should then be ignited and allowed to burn freely for 30 s. If necessary the anti-	The anti-exposure suit should melting after being removed from	not sustain burning or continue the flames.	Did the anti-exposure suit continue to burn or continue melting after being removed from the flames? YES NO Comments/Observations	
exposure suit should be draped over a hanger to ensure the whole of the suit is enveloped in the flames, with the bottom of the suit 25 cm above the top edge of the test pan so that the duration of exposure to the flames is 2 s.				

	Manufacturer:	Date:	Time:
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.4.20 Temperature cycling test	Regulations: LSA Code I/1.2.1.2; MSC.81(70) 1/3.1.16			
Test Procedure	Acceptance (Criteria	Significant Test Data	
The following test should be carried out on two immersion suits The anti-exposure suits should be alternately subjected to surrounding temperatures of -30°C and +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of 10 cycles, is acceptable: 1 an 8 h cycle at +65°C to be completed in one day; and 2 the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions until the next day; 3 an 8 h cycle at -30°C to be completed the next day; and 4 the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions until the next day.	The Anti-Exposure suit's material sh such as shrinking, swelling dissolut qualities.	hould show no signs of damage	(See following page for test data) Passed Failed Comments/Observations	

1 uge 210			
	Manufacturer:	_ Date:	Time:
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.4.21	Temperature cycling test - Test Data		Regulations: LSA Code I/1.2.1; MSC.81(70) 1/3.	1.16
	НС	OT CYCLE		COLD CYCLE
Cycle 1	Date In: Time In : Temperature : OC	Date Out:	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 2	Date In: Time In : Temperature : 0 C	Date Out: Time Out:hours	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 3	Date In: Time In : Temperature : 0 C	Date Out:	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 4	Date In: Time In : Temperature : OC	Date Out:	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 5	Date In: Time In : Temperature : OC	Date Out:	Date In: Time In: Temperature:0C	Date Out: Time Out: hours
Cycle 6	Date In: Time In : Temperature : 0 C	Date Out:	Time In :	Date Out: Time Out: Duration : hours
Cycle 7	Date In: Time In : Temperature : OC	Date Out:	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 8	Date In: Time In : Temperature : OC	Date Out:	Date In: Time In : Temperature : OC	Date Out: Time Out: Duration : hours
Cycle 9	Date In: Time In : Temperature : OC	Date Out:	Time In :	Date Out: Time Out: Duration : hours
Cycle 10	Date In: Time In: Temperature: 0C	Date Out:	Date In:	Date Out: Time Out: hours

				Page 21	
	Manufactur	er:	Date:	Time:	
Anti-Exposure suits	Model:		Surveyor:		
	Lot/Serial N	Number:	Organization:		
2.4.22 Buoyancy tes	t		Regulations: LSA Code II/2.4.1	1.1; MSC.81(70) 1/3.1.17	
Test Procedu	ure	Acceptano	ce Criteria	Significant Test Data	
The Anti-exposure suit sho buoyancy of at least 70 N	ould have inherent	The difference between the initial should not exceed 5% of the initial		Buoyancy 1 Buoyancy 2 % difference kg kg%	
The buoyancy of an anti-exp to be worn without a lif measured before and afte submersion to just below the water.	er 24 h complete			PassedFailed Comments/Observations	
2.4.23 Strength test			Regulations: LSA Code II; MS	C.81(70) 1/3.1.18	
Test Procedo	ure	Acceptano	ce Criteria	Significant Test Data	
The anti-exposure suit show water for a period of 2 min. the same manner as when v force of not less than 1350N for 30 min to the part of the to the body of the wearer.	The suit closed in worn by a person, a should be applied a suit that secures it	The anti-exposure suit should not test.	ot be damaged as a result of this	PassedFailed Comments/Observations	
Vest-type lifejacket Yoke or over The anti-exposure suit may to accommodate the test devi-	•				

1 ugc 212			
	Manufacturer:	Date:	Time:
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.4.24 Thermal protective test (General)	ral) Regulations: LSA Code II/2.3.2.1; MSC.81(70) 1/3.2.1 – 3.2.4		
Test Procedure	Acceptance Criteria	Significant Test Data	
The thermal protective qualities may be measured using a thermal manikin, when such a method is required by an Administration and has been demonstrated to provide test results which correlate satisfactorily in all aspects to test results using human subjects.		Comments/Observations	
If human subjects are used, they should be medically examined before being accepted for the tests. Each design of immersion suit is to be tested by test subjects specified in 2.3.1.5			
Where human subjects are used, the tests should always be conducted under the supervision of physician. Emergency resuscitation equipment should be available during all tests. For safety reasons, ECG should be monitored during every test. Testing should be stopped at the wish of the test subjects, or if the skin temperature of hand, foot or lumbar region should fall below 10° C, or if the attending physician considers it advisable.			
When testing with human subjects, continuous body core temperature (rectal temperature) and skin temperature of lumbar region, both hands, calves, foot (foot instep) and heels, should be measured. The accuracy of the measuring system should be 0.2°C. Appropriate corresponding measurements should be taken if a manikin is used in lieu of human subjects.			
Prior to tests, the same amount of water resulting from the jump test in paragraph 2.4.15 should be poured into the dry suit worn over the dry test clothing specified in 2.4.7 by the test subject lying down.			

			Page 21
	Manufacturer:	Date:	Time:
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2.4.25 Thermal Prote	ective test (Continued)	Regulations: LSA Code II/2	3.2.1.2; MSC.81(70) 1/3.2.9 & 3.2.10
Test Procedu	ure	Acceptance Criteria	Significant Test Data
Each test subject should we suit previously subjected to and jump test in paragraph 1 h period of immersion, with hood donned, in circulating 5°C, each test subject's bod should not fall more than 2° level of the subject's temperated Immediately on leaving completion of the test prescribest subject should be able to specified in paragraph 2.4.9. The anti-exposure suit should that when worn as marked, the provide sufficient thermal properties one jump into the was submerges the test subject that when it is worn in temperature of 5° C, the test temperature does not fall at 1.5°C per hour, after the first	ear an anti-exposure to the water ingress 2.4.13. Following a th hands gloved and g calm water at + ly core temperature 'C below the normal ature. the water after ribed in 2.4.24 each to pick up a pencil as and write. Id be so constructed, the suit continues to protection following ter which totally and should ensure calm water at a subject's body core a rate of more than	Acceptance Cheria	Same mass of water which was the result from test 2.4.15, should be poured into the immersion suit Beginning End Normal of test of test temperature Subject No.2
			Comments/Observations

rage 214	Manufacturer:	_ Date:	Time:
Anti-Exposure suits	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.4.26 Test sheets for temperatures during immersion tests Regulations: LSA Code II/2.4.2.1.2; MSC.81(70) 1/3.2.13 & 3.2.14

SUBJECT 1	SUBJECT 2	SUBJECT 3	SUBJECT 4	SUBJECT 5	SUBJECT 6
Rectal temp after 1 hr:	Rectal temp after 1 hr:	Rectal temp after 1 hr:	Rectal temp after 1 hr:	Rectal temp after 1 hr:	Rectal temp after 1 hr:
Skin temp at lumbar region after 1 hr :	Skin temp at lumbar region after 1 hr :	Skin temp at lumbar region after 1 hr :	Skin temp at lumbar region after 1 hr:	Skin temp at lumbar region after 1 hr :	Skin temp at lumbar region after 1 hr :
Skin temp at left hand after 1 hr:	Skin temp at left hand after 1 hr:	Skin temp at left hand after 1 hr:	Skin temp at left hand after 1 hr:	Skin temp at left hand after 1 hr:	Skin temp at left hand after 1 hr:
Skin temp at right hand after 1 hr:	Skin temp at right hand after 1 hr:	Skin temp at right hand after 1 hr:	Skin temp at right hand after 1 hr:	Skin temp at right hand after 1 hr:	Skin temp at right hand after 1 hr:
Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:
Skin temp at left foot (foot instep) after 1 hr:	1	Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:
Skin temp at right foot (foot instep) after 1 hr:	Skin temp at right foot (foot instep) after 1 hr:	Skin temp at right foot (foot instep) after 1 hr:	Skin temp at right foot (foot instep) after 1 hr:	Skin temp at right foot (foot instep) after 1 hr:	Skin temp at right foot (foot instep) after 1 hr:
Skin temp at left heel after 1 hr:	Skin temp at left heel after 1 hr:	Skin temp at left heel after 1 hr:	Skin temp at left heel after 1 hr:	Skin temp at left heel after 1 hr:	Skin temp at left heel after 1 hr:
Did the wearer's body core temperature fall at a rate more than 1,5°C per hour, after the first 0,5 h?	temperature fall at a rate more than 1,5°C per hour,	core temperature fall at a	core temperature fall at a rate more than 1,5°C per	Did the wearer's body core temperature fall at a rate more than 1,5°C per hour, after the first 0,5 h?	temperature fall at a rate
□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No

2.5 THERMAL PROTECTIVE AIDS

2.5.1	General data and specifications
2.5.2	Submitted drawings, reports and documents
2.5.3	Quality assurance
2.5.4	Visual inspection
2.5.5	Fabric test - Water resistance
2.5.6	Fabric test - Thermal conductance
2.5.7	Temperature cycling test
2.5.8	Test subjects
2.5.9	Test clothing
2.5.10	Donning test 1
2.5.11	Donning test 2 at low temperature
2.5.12	Discarding test
2.5.13	Oil resistance test

2.5 THERMAL PROTECTIVE AIDS EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

			1 uge 21
	Manufacturer:	Date:	Time:
Thermal Protective Aids	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
		<u> </u>	
2.5.1 General Data and	Specifications	Regulations: LSA Code II/2.3;	MSC.81(70);
General Information	n		
Construction Material:			Donning instructions:
Fabric manufactured by:			\Box YES \Box NO
Type:			
Is the TPA of highly visible colou	ır?		
			□YES □ NO

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	Manufa	cturer:	Date:	Time:	
Thermal Protective Aids	Thermal Protective Aids Model:_		Surveyor:		
	Lot/Seri	al Number:	Organization:		
2.5.2 Submitted	l drawings, reports and o	locuments			
		Submitted drawing	ngs and documents		Status
Drawing No.	Revision No. & date		Title of drawing		
		Submitted repor	rts and documents		Status
Report/Document No.	Revision No. & Date		Title of report / document		
		Maintenance Manual -			
		Operations Manual -			
			·		

	Manufacturer:	Date:	Time:
Thermal Protect	ctive Aids Model:	Surveyor:	
	Lot/Serial Number:	Organization:	
2.5.3	Quality Assurance	Regulations: -	
Except where a International C inspected, reproof manufacture used comply w Manufacturers that life-saving saving appliance	all appliances of a particular type are required by Chapte onvention for the Safety of Life at Sea, 1974, as amende esentatives of the Administration should make random in the specification of the approved prototype life-saving should be required to institute a quality control procedur appliances are provided to the same standard as the protoe approved by the Administration and to keep records of a carried out in accordance with the Administration's institute and the Administration in the Administration in the Administration's institute and the Administration in the	r III of the dd, to be anspections a materials g appliance. Quality Assurance Standard Used: - Quality Assurance Procedure: - The to ensure cotype life-framy Quality Assurance Manual: -	Yes/No

1 480 220			
	Manufacturer:	_ Date:	Time:
Thermal Protective Aids	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.5.4 Visual Inspection	Regulations: LSA Code II/2.3; N	MSC. 81(70);		
Test Procedure	Acceptance	e Criteria		Significant Test Data
Is the Thermal Protection Aid of high visible colour?			? Yes	?No
Does the Thermal Protection Aid cover the whole body of the wearer with the exception of the face?			? Yes	?No
If provided with arms, are the hand covered, or are permanently attached gloves provided?			? Yes	?No

Thermal Protective Aids Manufacturer: Model: Lot/Serial Number:		Surveyor:	Time:
2.5.5 Fabric Test - Water resistance		Regulations: LSA Code ; MSC	2.81(70) 1/3.3.1
Test Procedure	Acceptano	ce Criteria	Significant Test Data
The fabric from which the Thermal Protective Aids is constructed should be tested to determine its resistance to penetration by a 2m head of water.	The fabric should maintain its wa a column of water 2 m high.	tertight integrity when supporting	Does the material support a column of water of 2 m high YES NO Test method used: Comments/Observations
2.5.6 Fabric test - Thermal conductan	ce	Regulations: LSA Code II/2.5.1	; MSC.81(70) 1/3.3.2
Test Procedure	Acceptano	ce Criteria	Significant Test Data
The thermal conductance of the fabric of which the Thermal Protective Aid is manufactured should be measured.	The Fabric should have a thermal 7800 W/m ² K	conductance of not more than	Passed Failed All data is to be attached here. Comments/Observations

1 450 222			
	Manufacturer:	Date:	Time:
Thermal Protective Aids	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

Test Procedure	Accentance			
	Acceptanc	e Criteria	Signi	ficant Test Data
protective aid should be subjected to g temperatures of -30°C and +65°C. ernating cycles need not follow y after each other and the following	shrinking, swelling dissolution or changes of mechanical qualities		See following page for	test data.
repeated for a total of 10 cycles, is			Passed	Failed
s h cycle at +65°C to be completed in day; and			Comments/Observation	18
specimens removed from the warm mber that same day and left exposed er ordinary room conditions until the t day;				
B h cycle at -30°C to be completed next day; and				
specimen removed from the cold mber that same day and left exposed er ordinary room conditions until the t day;				
t s	day; and specimens removed from the warm nber that same day and left exposed er ordinary room conditions until the day; sh cycle at -30°C to be completed next day; and specimen removed from the cold nber that same day and left exposed er ordinary room conditions until the	specimens removed from the warm other that same day and left exposed er ordinary room conditions until the day; Sh cycle at -30°C to be completed next day; and specimen removed from the cold other that same day and left exposed er ordinary room conditions until the	day; and specimens removed from the warm mber that same day and left exposed er ordinary room conditions until the day; sh cycle at -30°C to be completed next day; and specimen removed from the cold mber that same day and left exposed er ordinary room conditions until the	day; and specimens removed from the warm inber that same day and left exposed er ordinary room conditions until the day; sh cycle at -30°C to be completed next day; and specimen removed from the cold inber that same day and left exposed er ordinary room conditions until the

			1 480 224
	Manufacturer:	Date:	_ Time:
Thermal Protective Aids	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.5.7	Temperature cycling test – Test	data	Regulations: LSA Code I/1.2.2.2; MSC.81(70) 1/.	3.3.3
		HOT CYCLE	C	OLD CYCLE
Cycle 1	Date In:	Date Out: Time Out:hour	Time In :	Date Out: Time Out: hours
Cycle 2	Date In:	Date Out: Time Out:hour	Date In: Time In :	Date Out: Time Out: hours
Cycle 3	Date In:	Date Out: Time Out:hour	Time In :	Date Out: Time Out:hours
Cycle 4	Date In:	Date Out: Time Out:hour	Time In :	Date Out: Time Out:hours
Cycle 5	Date In:	Date Out: Time Out:hour	Time In :	Date Out: Time Out:hours
Cycle 6	Date In:	Date Out: Time Out:hour	Time In :	Date Out: Time Out:hours
Cycle 7	Date In: Time In : Temperature : O	Date Out: Time Out:hour	Time In :	Date Out: Time Out: hours
Cycle 8	Date In: Time In : Temperature : O	Date Out: Time Out:hour	Time In :	Date Out: Time Out: hours
Cycle 9	Date In: Time In : Temperature :	Date Out: Time Out:hour	Time In :	Date Out: Time Out: hours
Cycle 10	Date In: Time In : Temperature :	Date Out: Time Out:hour	Date In: Time In : Temperature : OC	Date Out: Time Out: hours

1 age 22 1			
	Manufacturer:	_ Date:	Time:
Thermal Protective Aids	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.5.8 Test subjects	Test subjects Regulations: LSA Code II/2.5.2; MSC				
Test Procedure	Acceptance Criteria		Significant Test Data		
For these tests a group of at least six test subjects of different ages, both male and female in the large, medium and small size range should be selected.	1 perso 1.60 m – 1.80 m 1 perso 1 perso 1 perso 1 perso 1 perso 1 perso 1 perso	n under 60 kg n over 60 kg n under 70 kg n over 70 kg n under 80 kg n over 80 kg	Comments/Observations Male/Female Height Weight Subject 1 Subject 2 Subject 3 Subject 4 Subject 5 Subject 6		
2.5.9 Test clothing		Regulations: LSA Code II/2.5	; MSC.81(70) 1/3.3.5, 3.2.6 & 3.2.8		
Test Procedure	Acceptance Criteria		Significant Test Data		
The test subjects should wear a standard range clothing consisting of 1 underwear (short sleeved, short legged) 2 shirt(long sleeved) 3 trousers(not woollen, and woollen socks 4 in addition to the clothing the test subjects should wear two woollen pullovers during the tests prescribed in 2.5.10; 2.5.11 and 2.5.12.			Did all test subject use the specified test clothing □ YES □ NO Comments/Observations		

Manuf	acturer:	Date:	Time:		
Thermal Protective Aids Model	:	Surveyor:			
Lot/Se	rial Number:	Organization:			
2.5.10 Donning test (1)		Regulations: LSA Code II/2.5.2	.; MSC.81(70) 1/3.3.6		
Test Procedure	Acceptano	ce Criteria	Significant Test Data		
Following a demonstration, the test subjects should be able to unpack and don the Thermal Protection Aids over a lifejacket when seated in a survival craft or a rescue boat.	The test subjects should be able Protection Aides.	to unpack and don the Thermal	Time Subject No.1 sec Subject No.2 sec Subject No.3 sec Subject No.4 sec Subject No.5 sec Subject No.6 sec Comments/Observations		
2.5.11 Donning test (2) at low temperate	ıre	Regulations: LSA Code II/2.5.3	; MSC.81(70) 1/3.3.7		
Test Procedure	Acceptance	ce Criteria	Significant	Test Data	
The Thermal Protective aid should be capable of being unpacked and donned at an ambient temperature of – 30° C. Before the donning test the thermal protective aid should be kept in a refrigerated chamber at a temperature of -30°C for 24 h.	The test subjects should be able to thermal protective aid.	o successfully unpack and don the	Subject No.1 sec Subject No.2 sec Subject No.3 sec Subject No.4 sec Subject No.5 sec Subject No.6 sec Comments/Observations		

1 450 220			
	Manufacturer:	_ Date:	Time:
Thermal Protective Aids	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

2.5.12 Discarding Test		Regulations: LSA Code II/2.5;	MSC.81(70) 1/3.3.8
Test Procedure	Acceptance Criteria Significant Test Data		Significant Test Data
If the thermal protective aid impairs the ability of the test subjects to swim, it should be demonstrated that it can be discarded by the test subjects, when immersed in water, in not more than 2 min.	The test subject should be able to min.	complete this task in less than 2	Time Passed Failed Subject No.1 sec Subject No.2 sec Subject No.3 sec Subject No.4 sec Subject No.5 sec Subject No.6 sec Comments/Observations
2.5.13 Oil resistance test		Regulations: LSA Code II/1.2.2	4; MSC.81(70) 1/3.3.9
Test Procedure	Acceptance Criteria		Significant Test Data
After all its apertures have been sealed, a thermal protective aid should be immersed under 100 mm head of diesel oil for 24 h. The surface oil should then be wiped off and it should be established the thermal conductance of the material.	After this test the thermal protect damage, such as shrinking, crachange of mechanical qualities. The not more than 7800 W/m² K	acking, swelling, dissolution or	Is the thermal conductance of the thermal protective aid not more than 7800 W/m² K? YES NO Is there any sign of damage, such as shrinking, cracking, swelling, dissolution or change of mechanical qualities? YES NO Comments/Observations

3 VISUAL DISTRESS SIGNALS

3.1 ROCKET PARACHUTE FLARES

3.1.1	Submitted drawings, reports and documents
	3.1.1.1 Quality assurance
	3.1.1.2 Visual inspection
	3.1.1.3 General Data and Specifications
3.1.2	Temperature cycling test
3.1.3	Low Temperature Conditioning Test
3.1.4	High Temperature Conditioning Test
3.1.5	Humidity Conditioning Test
3.1.6	Water and Corrosion Resistance Test
	3.1.6.1 1 m immersion for 24 h test
	3.1.6.2 10 cm immersion for 5 min test
	3.1.6.3 Salt spray test
3.1.7	Handling Safety
	3.1.7.1 2 m Drop Test
	3.1.7.2 Immersion suit glove test
3.1.8	Luminous Intensity Test
3.1.9	Safety Inspection
3.1.10	Liferaft Drop Test

3.1 ROCKET PARACHUTE FLARES EVALUATION AND TEST REPORT

Manufacturer	
Type/Model	
Date of Approval	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

					1 agc 22
	Manufacture	er:	Date:	Time:	
Rocket Parachute Flare	es Model:		Surveyor:		
	Lot/Serial N	umber:	Organization:		
3.1.1 Submitted	d drawings, reports and o	locuments			
		Submitted drawin	ngs and documents		Status
Drawing No.	Revision No. & date		Title of drawing		
		~			
		Submitted repor	ts and documents		Status
Report/Document No.	Revision No. & Date		Title of report / document		
		Maintenance Manual -			
		Operations Manual -			

1 age 230			
	Manufacturer:	_ Date:	Time:
Rocket Parachute Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.1.1.1 Quality Assurance	Regulations: - MSC.81(70) 2/1.2
Except where all appliances of a particular type are required by Chapter III of the International Convention for the Safety of Life at Sea, 1974, as amended, to be inspected, representatives of the Administration should make random inspections of manufacturers to ensure that the quality of life-saving appliances and materials used comply with the specification of the approved prototype life-saving appliance. Manufacturers should be required to institute a quality control procedure to ensure that life-saving appliances are provided to the same standard as the prototype life-saving appliance approved by the Administration and to keep records of any production tests carried out in accordance with the Administration's instructions.	Quality Assurance Standard Used: - Quality Assurance Procedure: - Quality Assurance Manual: - Description of System.
	Quality Assurance System acceptable Yes/No Comments/Observations

	Manufacturer:	_ Date:	_ Time:
Rocket Parachute Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

Acceptance cket Parachute Flares should:- clearly marked with appro- dministration which approved it		Significant '	Test Data
clearly marked with appro			
d operational restrictions, marki	, date of manufacture and expiry	Passed	Failed
provided with brief instruction use of the rocket parachute fla	ns or diagrams clearly illustrating re printed on the casing;	Passed	Failed
not depend on adhesive tapes or plastic envelopes for its water- resistant properties		Passed	Failed
		Passed	Failed
		Passed	Failed
fitted with an integral means of	ignition;	Passed	Failed
		Passed	Failed
		Comments/Observations	
t sist si	depend on adhesive tapes or stant properties o designed as not to cause dising when used in according ructions; o constructed that the end from positively identified by day or interest with an integral means of administration should determine the standard of the stand	depend on adhesive tapes or plastic envelopes for its water-stant properties o designed as not to cause discomfort to the person holding the ng when used in accordance with the manufacturers ructions; o constructed that the end from which the rocket is ejected can positively identified by day or night; itted with an integral means of ignition;	depend on adhesive tapes or plastic envelopes for its water- stant properties o designed as not to cause discomfort to the person holding the ng when used in accordance with the manufacturers ructions; o constructed that the end from which the rocket is ejected can positively identified by day or night; itted with an integral means of ignition; administration should determine the period of acceptability of unit which are subject to deterioration with age.

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	Manufacturer:	_ Date: Tim	ne:
Rocket Parachute Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.1.1.3 General Data and Specifications		Regulations: LSA Code 1.2; MSC.81(70) Pt 1/4.6			
General Information	Dime	nsions	Weight		
1	Dimensions: Length of Casing: Diameter of Casing: Parachute Dimensions: Number of attachment Cords Diameter of Line:	nsions			
Acceptable life of the itemyrs					

	Manufacturer:	_ Date:	_ Time:
Rocket Parachute Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

TEST ITEMS CONDITIONING SEQUENCE	SPECIMEN NUMBER						REFERENCES	REMARKS			
	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-28	MSC81(70)	
Measuring dimensions and mass	A	A	A	A	A	A	A	A	A		
Temperature cycling test (3.1.2)	В									4.2.1	
Low temperature conditioning (3.1.3)		В								4.2.2	
High temperature conditioning (3.1.4)			В							4.2.3	
Humidity conditioning (3.1.5)				В						4.2.4	
1 m immersion for 24 hours (3.1.6.1)					В					4.3.1	
100 mm for 5 minutes (3.1.6.2)						В				4.3.2	
Salt water spray (3.1.6.3)							В			4.3.3	
2 m Drop Test (3.1.7.1)								В		4.4.1	
Safety inspection (3.1.10)	С	С	С	С	С	С	С	С		4.5	
Operation at ambient temperature	D				D	D	D	D		4.2.1, 4.3.1, 4.3.2, 4.3.3 & 4.4.1	

age 23 i			
	Manufacturer:	_ Date:	Time:
Rocket Parachute Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

Specimen No>	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-28	References	Remarks
Operate at conditioning Temperature		D	D	D						4.2.2, 4.2.3 & 4.2.4	
Operational test using immersion suit glove (3.1.7.2)	Е				Е			Е		/4.4.2	Use specimens # 2,#14 and #23
Vertical firing height, descent speed, burn time. (Note 1)			Е		Е	Е	Е			4.6.1	
45° firing to horizontal. (Note 2)	Е	Е		Е				Е		4.6.3	
Rocket recoil test for hand held only. (Note 3)	Е	Е	Е	Е	Е	Е	Е	Е		4.6.4	
Flare material test Colour and luminosity (3.1.9)										4.6.2	Additional flares may be used to measure the luminous intensity and may be carried out by an independent laboratory acceptable to the administration & report submitted.
Chute examination after recovery. (Note 4)	F	F	F	F	F	F	F	F		LSA. Code Chapter II, Para 3.1.2.5	
Liferaft Drop Test (4.2.4)									G	LSA Code Chapter IV Para 4.1.1.2	The liferaft manufacturer should complete this form

Note: The letters in the above `boxes' refer to the sequence of testing of each specimen Rocket Parachute Flare.

Note 1. Not all samples marked need to be fired at 90°. A representative sample of at least 18 specimens should be so assessed, so that a representative descent rate can be found.

Note 2. Not all samples marked need to be fired at 45°. A representative sample of at least 3 specimens should be so assessed.

Note 3. Not all samples need to be recoil tested. A representative sample of at least 3 rockets should be so assessed by hand firing.

Note 4. It is accepted that all parachutes may not be recoverable - as many as possible should be recovered and inspected for damage.

					1 age 23.
Manufac	turer:	Date:		Time:	
Rocket Parachute Flares Model:_		Surveyor:			
Lot/Seria	l Number:	Organization:			
3.1.2 Temperature cycling test		Regulations: LSA Code I/1.2 &	III/3.1; MSC.81(7	0) 1/1.2.1 & 4.2	
Test Procedure	Acceptan	ce Criteria		Significant Test Data	L .
The three specimens of parachute rocket flares	After the test, each specimen sho	ould show no sign of damage such	1	2	3
should be alternately subjected to surrounding		ing, dissolution or change of	Condition after co	onditioning (Pass/Fail))
temperatures of -30°C and +65°C. These	-	uld then function at ambient			
alternating cycles need not follow immediately after each other and the following procedure.			Ejection height of	flare (metres) Operat	tion 90 ⁰
repeated for a total of 10 cycles, is acceptable:	1. It should be established by	by means of accurate measuring			N/A
	-	te flares of specimens 1 and 2 are	Burn out height of	f flare (metres)	
1. an 8 h cycle at +65 °C to be completed in one day; and	ejected at a neight of not less	than 500 m.			N/A
·	_	e burns out and the burning period	Burn time of flare	(sec)	
2. the specimens removed from the warn chamber that same day and left exposed					
under ordinary room conditions until the	3. It should be established from	e established from these measurements that the rate	Descent rate of fla	are (m/s)	
next day;	of descent is not more than 5 less than 40 s.			N/A	
3. an 8 h cycle at -30°C to be completed			Operation at 45 ⁰ (Pass/Fail)	
the next day; and	4. Specimen 3 should function	n efficiently but need not reach a	N/A	N/A	
4. the specimen removed from the cold	height of 300 metres.		Height reached (n	netres)	
4. the specimen removed from the cold chamber that same day and left exposed	5. If the rocket is hand help	d when operated, it should be			N/A
under ordinary room conditions until the		s minimal.	Parachute condition	on (Pass/Fail)	
next day;	6. It should be determined by	examination that the flare has not			
The three parachute rockets after completing		chments whilst it was burning.	Recoil minimal (P	Pass/Fail)	
temperature cycling should function effectively					
at ambient temperature			Comments/Observ	vations	
Samples 1 and 2 should be fired vertically. Sample 3 should be fired at an angle of 45°.			Passed	Failed	

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	Manufacturer:	Date:	_ Time:
Rocket Parachute Flares	Model:	Surveyor:	
	Lot/Serial Number:	_ Organization:	

3.1.3 Low temperature conditioning te	st	Regulations: LSA Code I/1.2 & .III/3.1; MSC.81(70) 1/4.2.2				
Test Procedure	Acceptano	ce Criteria		Significant Test Data	ı	
Three parachute rockets should be subjected to	After the test, each specimen sho	ould show no sign of damage such	4	5	6	
a temperature of -30°C for at least 48 h.	as shrinking, cracking, swelli	ing, dissolution or change of	Condition after co	nditioning (Pass/Fail)	
a temperature of 50 0 for at loads 10 h.	mechanical qualities and short temperature.	uld then function at ambient				
Specimen 4 and 5 should be fired vertically.	-		Ejection height of	flare (metres) Opera	tion 90 ⁰	
Specimen6 should be fired at an angle of 45°.		by means of accurate measuring			N/A	
	ejected at a height of not less	te flares of specimen 4 and 5 are than 300 m.	Burn out height of	f flare (metres)		
					N/A	
	2. The height of which the flare should also be measured.	e burns out and the burning period	Burn time of flare (sec)			
	should also be incasured.					
		n these measurements that the rate 5 m/s and the burning period is not	Descent rate of flare (m/s)			
	of descent is not more than 5 less than 40 s.				N/A	
			Operation at 45 ⁰ (Pass/Fail)		
	4. Specimen 6 should function height of 300 metres.	Specimen 6 should function efficiently but need not reach a height of 300 matres	N/A	N/A		
	neight of 500 metres.		Height reached (m	netres)		
		ld when operated, it should be			N/A	
	demonstrated that its recoil is	minimal.	Parachute condition	on (Pass/Fail)		
		examination that the flare has not				
	damaged its parachute or atta	chments whilst it was burning.	Recoil minimal (P	ass/Fail)		
			Comments/Observ	vations		
			Passed	Failed		

314 High temperatu	re conditioning test	December 1 SA Code 1/1 2 & 111/3 1, MSC 91/70) 1/4 2 3	
	Lot/Serial Number:	Organization:	
Rocket Parachute Flares	Model:	Surveyor:	
	Manufacturer:	Date: Time:	
			1 age 237

3.1.4 High temperature conditioning -	III/3.1; MSC.81(70) 1/4.2.3			
Test Procedure	Acceptano	Significant Test Data			
Three parachute rockets should be subjected to a temperature of +65°C for at least 48 h . The three rockets should be fired vertically.	After the test, each specimen sho as shrinking, cracking, swelli mechanical qualities and short temperature. 1. It should be established be instruments that the parachu ejected at a height of not less 2. The height of which the flare should also be measured. 3. It should be established from of descent is not more than 5 less than 40 s. 4. If the rocket is hand held demonstrated that its recoil is	uld show no sign of damage suching, dissolution or change of uld then function at ambient by means of accurate measuring te flares of the three rockets are than 300 m. burns out and the burning period these measurements that the rate m/s and the burning period is not distributed when operated, it should be	7 Condition after con	8 nditioning (Pass/Fail) flare (metres) Opera flare (metres) (sec) re (m/s) n (Pass/Fail) ass/Fail)	9 l)
			Passed	Failed	

1 age 230			
	Manufacturer:	Date:	Time:
Rocket Parachute Flares	Model:	Surveyor:	
	Lot/Serial Number:	_ Organization:	

3.1.5 Humidity conditioning test		Regulations: LSA Code I/1.2 &	III/3.1; MSC.81(70) 1/4.2.4	
Test Procedure	Acceptano	ce Criteria		Significant Test Data	ı
Three specimens of parachute rockets should be	After the test, each specimen sho	uld show no sign of damage such	10	11	12
subjected to a temperature of +65°C and 90%	as shrinking, cracking, swelli	ng, dissolution or change of	Condition after co	nditioning (Pass/Fail)
relative humidity for at least 96 h, followed by ten days at 20°C to 25°C at 65% relative	mechanical qualities and show temperature.	uld then function at ambient			
humidity.	_		Ejection height of	flare (metres) Opera	tion 90 ⁰
Chariman 10 and 11 abould be fined ventically	1. It should be established be instruments that the parachu	by means of accurate measuring te flares of specimens 10 and 11			N/A
Specimen 10 and 11 should be fired vertically. Specimen 12 should be fired at an angle of 45°.	are ejected at a height of not l		Burn out height of	flare (metres)	
		1 . 14 1			N/A
	2. The height of which the flare should also be measured.	burns out and the burning period	Burn time of flare (sec)		
		these measurements that the rate m/s and the burning period is not	Descent rate of flare (m/s)		
	less than 40 s.				N/A
			Operation at 45 ⁰ (I	Pass/Fail)	
	4. Specimen 12 should function height of 300 metres.	n efficiently but need not reach a	N/A	N/A	
	C		Height reached (metres)		
		d when operated, it should be			N/A
	demonstrated that its recoil is	minimal.	Parachute condition	on (Pass/Fail)	
		examination that the flare has not			
	damaged its parachute or atta	chments whilst it was burning.	Recoil minimal (Pass/Fail)		
			Comments/Observ	ations	
			Passed	Failed	

_ Failed ____

Passed _____

						1 age 23.
	Manufactu	urer:	Date:	7	Гіте:	
			Surveyor:			
		Number:	Organization:			
3.1.6.1 1 m immersion for 24	hours test		Regulations: LSA Code I/1.2 &			
Test Procedure		Acceptano	ce Criteria	5	Significant Test Data	ı
Three parachute rockets should be	immersed	After the test, each rocket should	show no sign of damage such as	13	14	15
horizontally for 24 h under 1 m of wa		shrinking, cracking, swelling, dis	solution or change of mechanical	Condition after con	nditioning (Pass/Fail)
The three rockets should be fired very	tically	qualities and should then function	at ambient temperature.			
The three rockets should be fired ver	creary.		1. It should be established be by means of accurate measuring		flare (metres) Opera	tion 90 ⁰
			hute flares of the three rockets are ss than 300 m. The burns out and the burning period			
				Burn out height of	flare (metres)	
		should also be measured.		Burn time of flare	(sec)	
			these measurements that the rate			
		of descent is not more than 5 less than 40 s.	m/s and the burning period is not	Descent rate of fla	re (m/s)	ı
		iess than 40 s.				
			1 '		be Parachute condition (Pass/Fail)	
		demonstrated that its recoil is	minimal.			
			examination that the flare has not	Recoil minimal (Pa	ass/Fail)	
		damaged its parachute or atta	chments whilst it was burning.			
				Comments/Observ	vations	

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	Manufacturer:	Date:	Time:
Rocket Parachute Flares	Model:	_ Surveyor:	
	Lot/Serial Number:	Organization:	

3.1.6.2 10 cm immersion for 5 min test	3.1.6.2 10 cm immersion for 5 min test Regulations: LSA Code I/1.2 &) 1/4.3.2	
Test Procedure	Acceptano	ce Criteria	Significant Test Data		
Three parachute rockets should be immersed in the ready to fire condition for 5 min under 10	shrinking, cracking, swelling, dis	I show no sign of damage such as solution or change of mechanical	16 Condition after con	17 nditioning (Pass/Fail	18
cm of water . The three rockets should be fired vertically.	demonstrated that its recoil is minimal.		Ejection height of Burn out height of	flare (metres) Opera	ation 90 ⁰
			Burn time of flare	(sec)	
			Descent rate of fla	re (m/s)	
			Parachute conditio	on (Pass/Fail)	
			Recoil minimal (Pa	ass/Fail)	
			Comments/Observ	vations	
			Passed	Failed	

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		Manufacturer:	Date: Time:	
Rocket Pa	arachute Flares	Model:	Surveyor:	
		Lot/Serial Number:	Organization:	
3.1.6.3	Salt spray test		Regulations: LSA Code I/1.2 & III/3.1: MSC.81(70) 1/4.3.3	

3.1.6.3 Salt spray test Regulations: LSA Code I/1.2 & III/3.1; MSC.81(70) 1/4.3.3					
Test Procedure	Acceptanc	e Criteria	Significant Test Data		
Three specimens of parachute rockets should be subjected to a salt spray (5% Natrium Chloride		After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of		20 nditioning (Pass/Fail	21
solution) at a temperature of +35±3°C for at least 100 h.	mechanical qualities and shou temperature.				,
The three rockets should be fired vertically.	1. It should be established be by means of accurate measuring		Ejection height of	flare (metres) Opera	tion 90 ⁰
The three rockets should be fired vertically.	instruments that the parachu	instruments that the parachute flares of the three rockets are		flare (metres)	
	The height of which the flare should also be measured.	burns out and the burning period	Burn time of flare	(sec)	
	3. It should be established from these measurements that the rate of descent is not more than 5 m/s and the burning period is not				
			Descent rate of fla	re (m/s)	
	less than 40 s.		Parachute condition	on (Pass/Fail)	
	4. If the rocket is hand held demonstrated that its recoil is				
	5. It should be determined by e	xamination that the flare has not	Recoil minimal (P	ass/Fail)	
	damaged its parachute or attac	chments whilst it was burning.			
			Comments/Observ	ations	
Note: Natrium and Sodium are the same compound			Passed	Failed	

1 agc 2+2			
	Manufacturer:	_ Date:	Time:
Rocket Parachute Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.1.7.1 2 m Drop Test Regulations: LSA Code I/1.2 & I			III/3.1; MSC.81(70) 1/4.3.3	
Test Procedure	Acceptano	ce Criteria		Significant Test Data	a
Three parachute rockets should be dropped in	After the test, each specimen sho	ould show no sign of damage such	22	23	24
turn end-on and horizontally from a height of 2	as shrinking, cracking, swelli	ing, dissolution or change of	Condition after co	nditioning (Pass/Fail)
m on to a steel plate about 6 mm thick cemented on to a concrete floor. They should	mechanical qualities and sho temperature.	uld then function at ambient			
remain in a safe condition after this test.	•		Ejection height of	flare (metres) Opera	tion 90 ⁰
Specimen 10 and 11 should be fired vertically.		by means of accurate measuring ate flares of specimens 22 and 23			N/A
Specimen 12 should be fired at an angle of 45°.	are ejected at a height of not l		Burn out height of	flare (metres)	
2. The height of which the flare burns out and the burning period			N/A		
	The height of which the flare should also be measured.	burns out and the burning period	Burn time of flare (sec)		
	3. It should be established from these measure of descent is not more than 5 m/s and the buless than 40 s.		Descent rate of flare (m/s)		
		m/s and the burning period is not			N/A
			Operation at 45 ⁰ (l	Pass/Fail)	
	4. Specimen 24 should function height of 300 metres.	n efficiently but need not reach a	N/A	N/A	
			Height reached (m	etres)	
	5. If the rocket is hand held demonstrated that its recoil is	d when operated, it should be			N/A
	demonstrated that its recoil is	s minimai.	Parachute condition	on (Pass/Fail)	
		examination that the flare has not			
	damaged its parachute or atta	chments whilst it was burning.	Recoil minimal (P	ass/Fail)	
			Comments/Observ	ations	
			Passed	Failed	

	Surveyor:			
Acceptanc	e Criteria	S	ignificant Test Data	ı
		2 Condition after con	14 ditioning (Pass/Fail	23
temperature.	temperature.		lare (metres) Opera	tion 90 ⁰
1. It should be established be by means of accurate measuring instruments that the parachute flares of the three rockets are ejected at a height of not less than 300 m.		Burn out height of f	flare (metres)	
cally. 2. The height of which the flare burns out and the burning period should also be measured.		Burn time of flare ((sec)	
3. It should be established from these measurements that the rate of descent is not more than 5 m/s and the burning period is not	Descent rate of flar	e (m/s)		
		Parachute condition (Pass/Fail)		
5. It should be determined by e	xamination that the flare has not	Recoil minimal (Pa	ss/Fail)	
	Acceptance After the test, each specimen shown as shrinking, cracking, swelling mechanical qualities and shown temperature. 1. It should be established be instruments that the parachure ejected at a height of not less. 2. The height of which the flare should also be measured. 3. It should be established from of descent is not more than 5 less than 40 s. 4. If the rocket is hand held demonstrated that its recoil is. 5. It should be determined by experiments and shown as the sho	Regulations: LSA Code I/1.2 & Acceptance Criteria After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function at ambient temperature. 1. It should be established be by means of accurate measuring instruments that the parachute flares of the three rockets are ejected at a height of not less than 300 m. 2. The height of which the flare burns out and the burning period should also be measured. 3. It should be established from these measurements that the rate of descent is not more than 5 m/s and the burning period is not less than 40 s. 4. If the rocket is hand held when operated, it should be demonstrated that its recoil is minimal.	Regulations: LSA Code I/1.2 & III/3.1; MSC.81(70) Acceptance Criteria	Number:

1	age 2 44			
		Manufacturer:	Date: Time:	
	Rocket Parachute Flares	Model:	_ Surveyor:	
		Lot/Serial Number:	Organization:	

3.1.8 Luminous intensity test		Regulations: LSA Code I/1.2 &	HI/3.1; MSC.81(70) 1/4.6.2
Test Procedure	Acceptance Criteria		Significant Test Data
Laboratory testing of the rocket parachute flare should establish that it will burn with the required luminous intensity and colour.	The testing laboratory report soluminous intensity of the flare is a not less than 40 seconds, at temper. The measured chromaticity coboundaries of the area of the diag of the red light are given by follow $x_1 = 0.61 \qquad x_2 = 0.61 \qquad x_2 = 0.61 \qquad x_3 = 0.61 \qquad x_4 = 0.61 \qquad x_5 =$	at least 30,000 Cd for a period of ratures from -30°C to +65°C. ordinates should be within the gram as per CIE. The boundaries wing corner co-ordinates:	Laboratory Testing report Report acceptable (Yes/No) Luminous intensity levels achieved at – 30°CKCd Burning time of Flaresec Colour co-ordinates: x

	Manufacturer:	Date:	Time:
Rocket Parachute Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.1.9	Safety inspection	Regulations: LSA Code I/1.2 & III/3.1; MSC.81(70) 1/4.5			
	Test Procedure	Acceptance Criteria		Significant Test Data	
	ould be established by visual inspection he rocket parachute flare:				
1	is indelibly marked with clear and precise instructions on how it should be operated and that the danger end can be identified by day or night;		nstructions are marked on the parachute rocket flare clearly	Markings and identification of ends acceptable Passed Failed	
2	can, if hand operated, be operated from the bottom (safe end) or that it contains an operational safety delay of 2 seconds;	If operated from the top the time of	delay is not to be less than 2 s.	Time delay if operated from the top sec	
3	has a simple and integral means of ignition which requires the minimum of preparation and can be readily operated in adverse conditions without external aid and with wet, cold or gloved hands;	It has a simple means of ignition and gloved hands.	and can be operated by cold, wet	Operation of specimen when wet, cold and gloved hands. Passed Failed	
4	does not depend on adhesive tapes or plastic envelopes for its water resistant properties; and	Adhesive tapes or plastic envelop resistant properties.	es are not used to maintain water-	Water resistant without the use of envelopes or adhesive tape. Passed Failed	
5	can be indelibly marked with means of determining its age.	Date of manufacturing and date outside.	of expiry indelible printed on the	Indelible date stamped Passed Failed Comments/Observations	

1 ugc 240		
	Manufacturer:	Date: Time:
Rocket Parachute Flares	Model:	_ Surveyor:
	Lot/Serial Number:	Organization:

3.1.10 Liferaft drop test		Regula	gulations: LSA Code 1.2 & 4.1.1.2			
Test Procedure	Acceptance Criteria		Significant Test Data			
The liferaft in the operationally packed	Damage to any item of equipment is acceptable subject to the		25	26	27	28
condition should be suspended and then dropped from a height of 18 m into the water.	administration being satisfied that the operational efficient not been impaired.	at the operational efficiency has	Condition of	Condition of units (Pass/Fail)		
If the liferaft is to be stowed at a height greater than 18 m above the waterline in the lightest seagoing condition, it should be dropped from						
the height at which it is to be stowed.		nute flare should show no sign of	Passed	Faile	d	-
	damage such as shrinking, cracking, swelling, dissolution of change of mechanical qualities.		Comments/O	bservations		
Note: This test sheet should be completed by the liferaft manufacturer. Reference should be made to the test sheet 4.2.4.						

3.2 HAND FLARES

3.2.1	Submitte 3.2.1.1 3.2.1.2 3.2.1.3	d drawings, reports and documents Quality assurance Visual inspection General Data and Specifications	
3.2.2	Tempera	ture cycling test	
3.2.3	Low Ten	nperature Conditioning Test	
3.2.4	High Ter	mperature Conditioning Test	
3.2.5	Humidity	Conditioning Test	
3.2.6	Water an 3.2.6.1 3.2.6.2 3.2.6.3	d Corrosion Resistance Test 1 meter immersion for 24 hours test 100 mm immersion for 5 minutes test Salt spray Test	
3.2.7	Handling 3.2.7.1 3.2.7.2 3.2.7.3	2 m Drop Test	
3.2.8	Heptane	Test	
3.2.9	Luminou	s Intensity Test	
3.2.10	Liferaft Drop Test		
3.2.11	Safety Inspection		

3.2 HAND FLARES

Manufacturer	
Type/Model	
Date of Approval	
Place	
Name Surveyor printed	
Signature	
Approving Organisation	

Hand Flares			•		
	Lot/Serial Nur	nber:	Organization:		
3.2.1 Submitted di	rawings, reports and d	ocuments			
		Submitted drawings and			Status
Drawing No.	Revision No. & date		Title of drawing		
Submitted reports and documents					Status
Report/Document No.	Revision No. & Date		Title of report / document		
		Maintenance Manual -			
		Operations Manual -			

1 450 250			
	Manufacturer:	Date:	Time:
Hand Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.2.1.1 Quality Assurance	Regulations: - MSC.81(70) 2/1.2
Except where all appliances of a particular type are required by Chapter III of the International Convention for the Safety of Life at Sea, 1974, as amended, to be inspected, representatives of the Administration should make random inspections of manufacturers to ensure that the quality of life-saving appliances and materials used comply with the specification of the approved prototype life-saving appliance. Manufacturers should be required to institute a quality control procedure to ensure that life-saving appliances are provided to the same standard as the prototype life-saving appliance approved by the Administration and to keep records of any production tests carried out in accordance with the Administration's instructions.	Quality Assurance Standard Used: Quality Assurance Procedure: Quality Assurance Manual: Description of System.
	Quality Assurance System acceptable Yes/No Comments/Observations

	Manufacturer:	Date:	Time:
Hand Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.2.1.2 Visual inspection		Regulations: LSA Code I/1.2.2					
Test Procedure	Acceptance	Criteria	riteria Significant Test Data				
Visual examination:-	Red Hand Flares should:-						
Approval markings	be clearly marked with approved it, and operational restrictions, markin	date of manufacture and expiry	Passed	Failed			
Operating instructions.	be provided with brief instructions the use of the hand flare printed on		Passed	Failed			
Outer casing.	not depend on adhesive tapes or presistant properties	plastic envelopes for its water-	Passed	Failed			
Comfort.	be so designed as not to cause disco casing when used in accordant instructions;		Passed	Failed			
Operation	be so constructed that the end from be positively identified by day or ni		Passed	Failed			
Ignition System.	be fitted with an integral means of i	gnition;	Passed	Failed			
Life of Hand Flare	The administration should determine the unit which are subject to deterior		Passed	Failed			
			Comments/Observations				

1 age 232			
	Manufacturer:	Date:	Time:
Hand Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.2.1.3 General Data and Specifications		Regulations: LSA Code 1.2; MS	SC.81(70) 1/4.6
General Information	Dime	nsions	Weight
Construction Material:	Dimensions:		Design Weight:
Casing: Top cover (If applicable):	Length of Casing:		Weight As Tested: Weight of Flare Material Comments/Observations
Bottom Cover (If applicable):			Comments/ Observations
Method of Ignition Operational Safety Delay (if Applicable) ———————————————————————————————————			
Acceptable life of the itemyrs			

	Manufacturer:	_ Date:	Time:
Hand Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

TEST ITEMS CONDITIONING SEQUENCE	SPECIMEN NUMBER									REFERENCES	REMARKS
	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	MSC81(70)	
Measuring dimensions and mass	A	A	A	A	A	A	A	A			
Temperature cycling test (3.2.2)	В									4.2.1	
Low temperature conditioning (3.2.3)		В								4.2.2	
High temperature conditioning (3.2.4)			В							4.2.3	
Humidity conditioning (3.2.5)				В						4.2.4	
1 meter immersion for 24 hours (3.2.6.1)					В					4.3.1	
100 mm for 5 minutes (3.2.6.2)						В				4.3.2	
Salt water spray (3.2.6.3)							В			4.3.3	
2 m Drop Test (3.2.7.1)								В		4.4.1	
Safety inspection (3.2.10)	С	С	С	С	С	С	С	С	С	4.5	
Operation at ambient temperature	D				D	D	D	D	D	4.2.1, 4.3.1, 4.3.2, 4.3.3 & 4.4.1	

1 uge 25 1			
	Manufacturer:	_ Date:	Time:
Hand Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

Specimen No>	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-30	References	Remarks	
Operate at conditioning Temperature		D	D	D						4.2.2, 4.2.3 & 4.2.4		
Operational test using immersion suit glove (3.2.7.2)								Е		/4.4.2		
Burning time of flare	Е	Е	Е	Е	Е	Е	Е	Е		4.7.1		
Flare immersion test under water (3.2.7.3)			Е							4.7.1		
Heptane test (3.2.8)								Е		4.7.3		
Flare material test Colour and luminosity (3.2.9)									F	4.7.2	May be carried out by an independent laboratory acceptable to the administration & report submitted. Use specimens 29 to 30	
Liferaft Drop Test									G	LSA Code Chapter IV Para 4.1.1.2	The liferaft manufacturer should complete this form	

Note: The letters in the above `boxes' refer to the sequence of testing of each specimen Hand Flare.

	Manufacture	er:	Date:		Time:		
Hand	Flares Model:		Surveyor:				
	Lot/Serial N	umber:	Organization:				
3.2.2	Temperature cycling test		Regulations: LSA Code I/1.2 &	III/3.2; MSC.81(70	0) 1/1.2.1 & 4.2		
	Test Procedure	Acceptance	ee Criteria	5	Significant Test Data	ı	
The t	hree specimens of hand flares should be	After the test, each specimen sho	uld show no sign of damage such	1	2	3	
altern	ately subjected to surrounding	as shrinking, cracking, swelli	ng, dissolution or change of	Condition (Pass/Fa	nil)		
	eratures of -30°C and +65°C. These ating cycles need not follow immediately	mechanical qualities and show temperature.	ald then function at ambient				
after	Each other and the following procedure,			Burn time (sec)			
repeat	ted for a total of 10 cycles, is acceptable:	The three flares should burn for a	period of not less than 1 minute.	Tr: 1.1 (16	1. 11 \ / \ \		
1.	an 8 h cycle at +65 °C to be completed in			Time delay (if applicable) (sec)			
	one day; and	The hand flare should not cause the casing and not endanger the					
2.	the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions until the next day;	glowing residues when used in ac operating instructions		Comments/Observ	ations		
3.	an 8 h cycle at -30°C to be completed the next day; and						
4.	the specimen removed from the cold chamber that same day and left exposed under ordinary room conditions until the next day;						
tempe	nree hand flares after completing erature cycling should function effectively bient temperature			Passed	Failed		

1 450 250			
	Manufacturer:	Date:	Time:
Hand Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.2.3 Low temperature conditioning te	st	Regulations: LSA Code I/1.2 &	III/3.2; MSC.81(70) 1/4.2	
Test Procedure	Acceptano	ce Criteria		Significant Test Data	
Three specimens of hand flare should be	After the test, each specimen sho	uld show no sign of damage such	4	5	6
subjected to a temperature of -30°C for at least	as shrinking, cracking, swelli	ing, dissolution or change of	Condition (Pass/I	Fail)	
48 h. and should then function at that temperature.	mechanical qualities.				
temperature.	The three flares should burn for a	period of not less than 1 minute	Burn time (sec)		
		discomfort to the person holding he survival craft by burning or	Time delay (if ap	pplicable) (sec)	
	glowing residues when used in ac	ecordance with the manufacturer's			
	operating instructions.		Comments/Observations		
			Passed	Failed	

						Page 2.	
	Manufacture	er:	Date:		Гіте:		
Hand Flares	Model:		Surveyor:				
	Lot/Serial N	Jumber:	Organization:				
3.2.4 High ten	nperature conditioning to	est	III/3.2; MSC.81(70	1/4.2			
Test Procedure Acceptance			ce Criteria	S	ignificant Test Data	a	
Three specimens of	hand flares should be	After the test, each specimen sho	ould show no sign of damage such	7	8	9	
	ure of +65°C for at least	as shrinking, cracking, swell	ing, dissolution or change of	Condition (Pass/Fa	il)		
	tion effectively at that	_	uld then function at ambient				
temperature.		temperature.		Burn time (sec)			
		The three flares should burn for a	period of not less than 1 minute				
		The hand flare should not cause	discomfort to the person holding	Time delay (if applicable) (sec)			
			he survival craft by burning or				
			ccordance with the manufacturer's	Comments/Observations			
				Passed	Failed		

1 ugc 250			
	Manufacturer:	_ Date:	Time:
Hand Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.2.5 Humidity conditioning test		Regulations: LSA Code I/1.2 &	& III/3.2; MSC.81(70) 1/4.2.4		
Test Procedure	Acceptanc	e Criteria	Significant Test Data		
Three specimens of hand flares should be	After the test, each specimen show		10 Condition (Pass/F	11 ail)	12
subjected to a temperature of +65°C and 90% relative humidity for at least 96h, followed by	as shrinking, cracking, swelling mechanical qualities and show			aii)	
ten days at 20°C to 25°C at 65% relative	temperature.		Burn time (sec)		
humidity.	The three flares should burn for a	period of not less than 1 minute.			
	The hand flare should not cause	discomfort to the person holding	Time delay (if app	olicable) (sec)	
T tt	the casing and not endanger the glowing residues when used in accoperating instructions	e survival craft by burning or	Comments/Observ	vations	
			Passed	Failed	

Hand Flares		er:	Date:Surveyor:		Гіте:	
	Lot/Serial N	lumber:	Organization:			
3.2.6.1 1 meter immer	sion for 24 hours t		Regulations: LSA Code I/1.2 &			
Test Procedur			ce Criteria	, , , , , , , , , , , , , , , , , , ,	ignificant Test Data	
Three specimens of hand			uld show no sign of damage such	13	14	15
immersed horizontally for 24		as shrinking, cracking, swelli	ing, dissolution or change of	Condition (Pass/Fai	1)	
water.		mechanical qualities and shortemperature.	uld then function at ambient			
				Burn time (sec)		
		The three flares should burn for a	period of not less than 1 minute	T: 11 ('C 1	. 11) (
		The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions		Time delay (if appl	icable) (sec)	
				Comments/Observations		
				Passed	Failed	

1 ugc 200			
	Manufacturer:	_ Date:	Time:
Hand Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.2.6.2 100 mm immersion for 5 min test Regulations: LSA Code I/1.2 & I			III/3.2; MSC.81(70) 1/4.3.2	
Test Procedure	Acceptano	ce Criteria	Significant Test Data		
Three specimens of hand flares should be immersed horizontally in the ready to fire condition for 5 min under 100 mm of water.	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function at ambient		16 Condition (Pass/Fa	17 il)	18
condition for 3 mm under 100 mm of water.	temperature.	and then function at amorem	Burn time (sec)		
	The three flares should burn for a	period of not less than 1 minute.			
	The hand flare should not cause	discomfort to the person holding	Time delay (if app	licable) (sec)	1
	The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or		Comments/Observ		
			Passed	Failed	

					1 450 2
Manufactu	rer:	Date:	7	Time:	
Hand Flares Model:		Surveyor:			
Lot/Serial	Number:	Organization:			
3.2.6.3 Salt Spray Test		Regulations: LSA Code I/1.2 &	z III/3.2; MSC.81(70)	1/4.3.3	
Test Procedure	Acceptan	ce Criteria	Si	gnificant Test Data	a
Three specimens of hand flares should be	After the test, each specimen sho	ould show no sign of damage such	19	20	21
subjected to a salt spray (5% natrium chloride	as shrinking, cracking, swell	ing, dissolution or change of	Condition (Pass/Fai	1)	
solution) at a temperature of +35±3°C for at	4	mechanical qualities and should then function at ambient temperature.			
least 100 h.	temperature.			Burn time (sec)	
	The three flares should burn for a	period of not less than 1 minute			
	The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.		Time delay (if applicable) (sec)		
			Comments/Observations		
Note: Natrium and Sodium are the same compound			Passed	Failed	

1 ugc 202			
	Manufacturer:	_ Date:	_ Time:
Hand Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.2.7.1 2 m Drop Test Regulations: LSA Code I/1.2 & II			III/3.2; MSC.81(70) 1/4.3.3	
Test Procedure	Acceptano	ce Criteria	Significant Test Data		
Three specimens of hand flare should be	After the test each hand flare sho	uld show no sign of damage such	22	23	24
dropped in turn on both ends and horizontally	as shrinking, cracking, swelli	ng, dissolution or change of	Condition (Pass/Fa	il)	
from a height of 2 m on to a steel plate about 6 mm thick cemented on to a concrete floor.	be operated and function effective	operable and should subsequently			
	-		Burn time (sec)		
	They should burn for a period of a	not less than 1 minute.			
		discomfort to the person holding	Time delay (if app	licable) (sec)	
		he survival craft by burning or coordance with the manufacturer's			
	operating instructions	ceordance with the manufacturer s	Comments/Observations		
			Passed	Failed	
			r asseu	raneu	

						1 450 2	
	Manufacture	er:	Date:	<i>,</i>	Гіте:		
Hand Flares	Model:		Surveyor:				
	Lot/Serial N	Jumber:	Organization:				
3.2.7.2	Immersion suit glove test		Regulations: LSA Code I/1.2 &	III/3.2; MSC.81(70)		
	Test Procedure	Acceptan	ce Criteria	S	ignificant Test Data	ı	
Three specir	mens of hand flare should be	The three specimens should	be capable of being operated	19	20	21	
activated in a	accordance with the manufacturer's	effectively without injury to the	operator, or any person in close	Operation using glo	ove (Pass/Fail)		
	tructions by an operator wearing buoyant immersion suit or the	proximity during firing or burnir not less than 1 minute	g, they must burn for a period of				
	n from an insulated buoyant	not less than I minute		Burn time (sec)			
immersion su	it.		discomfort to the person holding				
		the casing and not endanger the survival craft by burning of glowing residues when used in accordance with the manufacturer's operating instructions.		Time delay (if applicable) (sec)			
				Type of Glove used			
				Type of Glove used	1		
				Comments/Observations			
				Passed	Failed		

1 agc 204			
	Manufacturer:	_ Date:	_ Time:
Hand Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.2.7.3 Handling safety Immersion test	Regulations: LSA Code I/1.2 &	III/3.2; MSC.81(7	0) 1/4.7.1	
Test Procedure	Acceptance Criteria	Significant Test Data		
Three hand flares should be activated and	The three specimens should operate effectively under water	7	8	9
should burn period of not less than 1 min. After	without injury to the operator for a period of 10 s, the flare should	Under-water opera	ation (Pass/Fail)	
burning for 30 s each flare should be immersed	burn for a period of not less than 1 min.			
horizontally under 100 mm of water for a period of 10 and should continue to burn for at	The hand flare should not cause discomfort to the person holding	Burn time (sec)		
least a further 20 s.	the casing and not endanger the survival craft by burning or			
	glowing residues when used in accordance with the manufacturer's operating instructions.	Time delay (if app	olicable) (sec)	
	operating instructions.			
		Comments/Observations		
		Comments/ Observations		
		Passed Failed		

					1 age 2	
	Manufacture	er:	Date:		Time:	
Hand Flares	Model:		Surveyor:			
	Lot/Serial N	Jumber:	Organization:			
			<u> </u>			
3.2.8 Heptane test	t		Regulations: LSA Code I/1.2 &	III/3.2; MSC.81(70	0) 1/4.7.3	
Test Proced	dure	Acceptano	ce Criteria	:	Significant Test Data	ì
Three hand flares should be	e activated at 45° 1.2	The three specimens should not is	gnite the heptane. The flare should	22	23	24
m above a test pan 1 m		burn for a period of not less than		Heptane ignition (Pass/Fail)	
2 litres of heptane floating						
The test should be condutemperature of +20°C to			discomfort to the person holding he survival craft by burning or	Burn time (sec)		
should be allowed to burn c		the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's				
		operating instructions.		Time delay (if applicable) (sec)		
					(111)	
				- 121		
				Comments/Observations		
				Passed	Failed	

1 4gc 200	Manufacturer:	_ Date:	Time:
Hand Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.2.9 Luminous intensity test	Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70)		
Test Procedure	Acceptano	ce Criteria	Significant Test Data
Laboratory testing of the flare should establish that it will burn with the required luminous intensity and colour.	luminous intensity of the flare is a not less than 1 minute, at tempera The measured chromaticity co-	ordinates should be within the gram as per CIE. The boundaries wing corner co-ordinates:	Laboratory Testing report No.:

							1 age 2
	Manufactur	er:	Date:		Time:		
Hand Flares	Model:		Surveyor:				
	Lot/Serial N	Number:	Organization:				
3.2.10 Liferaft dro	op test		Regul	ations: LSA C	ode 1.2 & 4.1.1	.2	
Test Proce	edure	Acceptan	ce Criteria		Significan	t Test Data	
The liferaft in the o			nent is acceptable subject to the	25	26	27	28
condition should be su dropped from a height of If the liferaft is to be stow	18 m into the water.	not been impaired.	at the operational efficiency has	Condition of	units (Pass/Fai	il)	
than 18 m above the wat seagoing condition, it sho	terline in the lightest						
the height at which it is to				Comments/C	Observations		
Note: This test sheet sho the liferaft manufacturer. made to the test sheet 4.2.4	Reference should be						

1 agc 200			
	Manufacturer:	_ Date:	Time:
Hand Flares	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.2.	11 Safety Inspection		Regulations: LSA Code I/1.2 &	III/3.2; MSC.81(70) 1/4.5
Test Procedure		Acceptance Criteria		Significant Test Data
It should be established by visual inspection that the hand flare:				
1.	is indelibly marked with clear and precise instructions on how it should be operated and that the danger end can be identified by day or night;	flare and the hand flare clearly identifies the danger end.		Markings and identification of ends acceptable Passed Failed
2.	can, if hand operated, be operated from the bottom (safe end) or that it contains an operational safety delay of 2 seconds;	If operated from the top the time delay is not to be less than 2 s.		Time delay if operated from the top sec
3.	has a simple and integral means of ignition which requires the minimum of preparation and can be readily operated in adverse conditions without external aid and with wet, cold or gloved hands;	It has a simple means of ignition and gloved hands.	and can be operated by cold, wet	Operation of specimen when wet, cold and gloved hands. Passed Failed
4.	does not depend on adhesive tapes or plastic envelopes for its water resistant properties; and	Adhesive tapes or plastic envelop resistant properties.	es are not used to maintain water-	Water resistant without the use of envelopes or adhesive tape. Passed Failed
5.	can be indelibly marked with means of determining its age.	Date of manufacturing and date outside.	of expiry indelible printed on the	Hand flare indelible date stamped. Passed Failed Comments/Observations
				Commence, Coser various

3.3 BUOYANT SMOKE SIGNALS

EVALUATION AND TEST REPORT

3.3.1	Submitted drawings, reports and documents
	3.3.1.1 Quality assurance
	3.3.1.2 Visual inspection
	3.3.1.3 General Data and Specifications
3.3.2	Temperature cycling test
3.3.3	Low Temperature Conditioning Test
3.3.4	High Temperature Conditioning Test
3.3.5	Ambient Temperature Conditioning Test
3.3.6	Humidity Conditioning Test
3.3.7	Water and Corrosion Resistance Test
	3.3.7.1 1 meter immersion for 24 hours tes
	3.3.7.2 100 mm immersion for 5 min test
	3.3.7.3 Salt spray Test
3.3.8	Handling Safety
	3.3.8.1 2 m Drop Test
	3.3.8.2 Immersion suit glove test
3.3.9	Heptane Test
3.3.10	Laboratory Smoke Obscuration Test
3.3.11	Wave Test
3.3.12	Liferaft Drop Test
3.3.13	Safety Inspection

3.3 BUOYANT SMOKE SIGNALS

EVALUATION AND TEST REPORT

Manufacturer	
Type/Model	
Date of Approval	
Place	
Name Surveyor printed	
Signature	
Approving Organisation	

	Manufacturer	: Date: Time:		
Buoyant Smoke Signals Model:		Surveyor:		
Lot/Serial Nu		mber:Organization:		
3.3.1 Submitted	l drawings, reports and d			
	Submitted drawings and documents			
Drawing No.	Revision No. & date	Title of drawing		
			1	
		Submitted reports and documents	Status	
Report/Document No.	Revision No. & Date	Title of report / document		
		Maintenance Manual -		
		Operations Manual -		

1 age 2/2			
	Manufacturer:	_ Date:	Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.3.1.1 Quality Assurance	Regulations: -
Except where all appliances of a particular type are required by Chapter III of the International Convention for the Safety of Life at Sea, 1974, as amended, to be inspected, representatives of the Administration should make random inspections of manufacturers to ensure that the quality of life-saving appliances and materials used comply with the specification of the approved prototype life-saving appliance. Manufacturers should be required to institute a quality control procedure to ensure that life-saving appliances are provided to the same standard as the prototype life-saving appliance approved by the Administration and to keep records of any production tests carried out in accordance with the Administration's instructions.	Quality Assurance Standard Used: - Quality Assurance Procedure: - Quality Assurance Manual: - Description of System. Quality Assurance System acceptable Yes/No Comments/Observations

	Manufacturer:	Date:	Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.3.1.2 Visual inspection				
Test Procedure	Acceptance Criteria		Significant Test Data	
Visual examination:-	Buoyant Smoke Signals should:-			
Approval markings	be clearly marked with approval information including the Administration which approved it, date of manufacture and expiry and operational restrictions, markings are to be indelible;		Passed	Failed
Operating instructions.	be provided with brief instructions or diagrams clearly illustrating the use of the buoyant smoke signal printed on the casing;		Passed	Failed
Outer casing.	not depend on adhesive tapes or plastic envelopes for its water-resistant properties		Passed	Failed
Comfort.	be so designed not to ignite expl with the manufacturers instruction	osively when used in accordance as;	Passed	Failed
Operation	be so constructed that the end from be positively identified by day of during the entire emission time or		Passed	Failed
Ignition System.	be fitted with an integral means of ignition;		Passed	Failed
Life of Smoke Signal	The administration should detern the unit which are subject to deter	nine the period of acceptability of ioration with age.	Passed Comments/Observations	Failed

1 450 27 1			
	Manufacturer:	Date:	
Buoyant Smoke Signals	Model:	_ Surveyor:	
	Lot/Serial Number:	Organization:	

TEST ITEMS CONDITIONING SEQUENCE				SPEC	IMEN N	UMBER				REFERENCES	REMARKS
	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	MSC81(70)	
Measuring dimensions and mass	A	A	A	A	A	A	A	A	A		
Temperature cycling test (3.3.2)	В	В	В							4.8.1	
Low temperature conditioning (3.3.3)	С									4.8.1	
High temperature conditioning (3.3.4)		С								4.8.1	
Ambient temperature conditioning. (3.3.5)			С							4.8.1	
Humidity conditioning (3.3.6)				С						4.2.4	
1 meter immersion for 24 hours (3.2.7.1)					С					4.3.1	
100 mm for 5 minutes (3.2.7.2)						С				4.3.2	
Salt water spray (3.2.7.3)							С			4.3.3	
2 m Drop Test (3.3.8.1)								С		4.4.1	
Safety inspection (3.3.13)	D	D	D	D	D	D	D	D		4.5	

	Manufacturer:	_ Date:	Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

Specimen No>	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-26	References	Remarks
Operation at ambient temperature			Е		Е	Е	Е	Е		4.3.1, 4.3.2, 4.3.3 & 4.4.1, 4.8.1	
Operate at conditioning Temperature	Е	Е		Е						4.2.4 4.8.1	
Operational test using immersion suit glove (3.3.8.2)							F			4.4.2	
Heptane test (3.3.9)								F		4.8.2	
Smoke material test Smoke obscuration (3.3.10)										4.8.3	Additional smoke signals may be submitted to an independent laboratory acceptable to the Administration and report submitted.
Wave height test (3.3.11)				G						4.8.4	
Smoke emission time 3 minutes minimum, Smoke colour	Н	Н	Н	Н	Н	Н	Н	Н		4.8.1	
Liferaft Drop Test (3.3.12) & (4.2.4)									I	LSA Code Chapter IV Para 4.1.1.2	The liferaft manufacturer should complete this form

Note: The letters in the above 'boxes' refer to the sequence of testing of each specimen Buoyant Smoke Signal.

1 agc 270			
	Manufacturer:	_ Date:	Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.3.2 Temperature cycling test]	Regulations: LSA Code I/1.2 &	III/3.3; MSC.81(70	0) 1/1.2.1 & 4.8.1		
Test Procedure	Acceptance	Criteria	5	Significant Test Data		
The 9 specimens of smoke signals should be	After 10 alternating cycles each	specimen should no sign of	1	2	3	
alternately subjected to surrounding	damage such as shrinking, crack		Condition (Pass/Fail)			
temperatures of -30C and +65C. These alternating cycles need not follow immediately	change of mechanical properties.					
after each other and the following procedure,				·		
repeated for a total of 10 cycles, is acceptable:			4	5	6	
			Condition (Pass/Fa	nil)		
1. an 8 h cycle at +65C to be completed in						
one day; and				· · · · · · · · · · · · · · · · · · ·		
2. the specimens removed from the warm		,	7	8	9	
chamber that same day and left exposed under ordinary room conditions until the			Condition (Pass/Fail)			
next day;						
2 and havelent 200 to be completed the			Comments/Observations			
3. an 8 h cycle at -30C to be completed the next day; and						
4. the specimen removed from the cold chamber that same day and left exposed under						
ordinary room conditions until the next day.						
			Passed	Failed		
			r asseu	Falled		

						1 450 2	
	Manufacture	er:	Date:		Time:		
Buoyant Smoke Signals	Model:		Surveyor:				
	Lot/Serial N	[umber:	Organization:				
3.3.3 Low temperatu	are conditioning te	st	Regulations: LSA Code I/1.2 &	& III/3.3; MSC.81(70	0) 1/4.8.1		
Test Procedure	re	Acceptano	ce Criteria		Significant Test Da	ıta	
Three smoke signals that	have undergone	After conditioning each specime	n should no sign of damage such	1	2	3	
temperature cycling should	be taken from a	as shrinking, cracking, swell			ail)	•	
stowage temperature of -30°C	be activated and	mechanical properties.					
operate in seawater at a temper	rature of -1 C.	The 3 specimens of smoke signal	s should function effectively, they	Smoke emission to	Smoke emission time (min/sec)		
		should emit smoke of a highly vis	sible colour at a uniform rate for a				
		period of not less than 3 minutes v	Smoke colour (Pas	ss/Fail)			
		The buoyant smoke signal should	l not ignite explosively when used	1			
		in accordance with the manufac	turer's instructions, nor emit any		licable) (sec)	_	
		flame during the entire smoke em The colour of the smoke should		,			
		34, 48, 49 or 50 of the publication			uality (Continuous.	/Intermittent)	
		Dictionary of Names. *					
		*Special Publication 440, N	Tational Bureau of Standards	Comments/Observ	ations		
		Washington, DC 20402, USA.		,			
				Passed	Failed		

1 age 270			
	Manufacturer:	Date:	Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	_ Organization:	

3.3.4 High temperature conditioning to	est	Regulations: LSA Code I/1.2 &	III/3.3; MSC.81(7	0) 1/4.8.1	
Test Procedure	Acceptano	ce Criteria		Significant Test Data	a
Three smoke signals that have undergone	After conditioning each specime	en should no sign of damage such	4	5	6
temperature cycling should be taken from a	as shrinking, cracking, swelli	ing, dissolution or change of	Condition (Pass/Fail)		
stowage temperature of +65 °C, be activated and operate in seawater at a temperature of +30 °C.	mechanical properties.				
operate in seawater at a temperature of 130 C.		s function effectively, they should	Smoke emission t	ime (min/sec)	
	emit smoke of a highly visible co of not less than 3 minutes when fl	lour at a uniform rate for a period			
		S	Smoke colour (Pas	ss/Fail)	
		I not ignite explosively when used			
	in accordance with the manufacturers instructions, not emit any flame during the entire smoke emission time.		Time delay (if applicable) (sec)		
	The colour of the smoke should be orange as defined by sections	Smoke emission quality (Continuous/Intermittent)			
		n Colour: Universal Language and	Smoke emission q	uality (Continuous/I	ntermittent)
	Dictionary of Names. *				
	*Special Publication 440, N Washington, DC 20402, USA.	ational Bureau of Standards,	Comments/Observ	vations	
	washington, DC 20402, USA.				
			Passed	Failed	

							Page 2
	Manufacture	er:	Date:			Time:	
Buoyant Smoke Signals	Model:		Surveyor:				
	Lot/Serial N	[umber:	Organization:				
3.3.5 Ambient temper	ature conditionii	ng test	Regulations: LSA Code I/1	1.2 & 1	III/3.3; MSC.81(7	0) 1/4.8.1	
Test Procedure		Acceptano	ce Criteria			Significant Test Da	ata
Three smoke signals that h	nave undergone	After conditioning each specime	n should no sion of damage s	such	7	8	9
temperature cycling should	be taken from	as shrinking, cracking, swell			Condition (Pass/F	ail)	
ordinary room conditions and		mechanical properties.					
emitting smoke for 1 minute they should be fully submerged for a period of not less than 10 seconds.		The 3 specimens of smoke signal	s should function effectively,	they	Smoke emission time (min/sec)		
		should emit smoke of a highly visible colour at a uniform rate for a					
		period of not less than 3 minutes when floating in calm water.			Smoke colour (Pass/Fail)		
		The buoyant smoke signal should					
		in accordance with the manufac		any	Time delay (if app	olicable) (sec)	
		flame during the entire smoke em The colour of the smoke should		tions			
		34, 48, 49 or 50 of the publication			Smoke emission during submerge test (Pass/Fail)		
		Dictionary of Names. *					
		*Special Publication 440, N Washington, DC 20402, USA.	ational Bureau of Standa	ards,	Comments/Observ	vations	
					D 1	F '1 1	
					Passed	Failed	

1 ugc 200			
	Manufacturer:	Date:	Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.3.6 Humidity conditioning test		Regulations: LSA Code I/1.2 &	III/3.3; MSC.81(70) 1/4.2.4			
Test Procedure	Acceptano	ce Criteria	:	Significant Test Dat	a	
, e		n should no sign of damage suching, dissolution or change of on effectively, they should emit at a uniform rate for a period of ting in calm water not ignite explosively when used turers instructions, not emit any ission time. be orange as defined by sections a Colour: Universal Language and	10 Condition (Pass/Fa Smoke emission ti Smoke colour(Pass Time delay (if app	Significant Test Dat 11 nil) me (min/sec) s/Fail) licable) (sec) uality (continuous/i	12	
			Passed	Failed		

Passed _____ Failed _____

						Page 2
	Manufacture	er:	Date:	T	ime:	
Buoyant Smoke Signals	Model:		Surveyor:			
	Lot/Serial N	umber:	Organization:			
3.3.7.1 1 meter immersi	ion for 24 hours t	est	Regulations: LSA Code I/1.2 &	III/3.3; MSC.81(70)	1/4.3.1	
Test Procedure		Acceptano	ce Criteria	Si	gnificant Test Dat	a
Three specimens of smoke sign	onals should be	After conditioning each specime	n should no sign of damage such	13	14	15
immersed horizontally for 24 water and than subjected to the	h under 1 m of	as shrinking, cracking, swelling, dissolution or change of mechanical properties.				
ambient temperature.		The three specimens should function effectively, they should emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 minutes when floating in calm water.		Smoke emission tim	ne (min/sec)	
				Smoke colour (Pass/	(Fail)	
		The buoyant smoke signal should				
		in accordance with the manufacturers instructions, not emit any flame during the entire smoke emission time.		Time delay (if applicable) (sec)		
		frame during the churc smoke chin	ission time.			
34, 48, 4 Dictiona *Special		The colour of the smoke should be orange as defined by sections 34, 48, 49 or 50 of the publication Colour: Universal Language and Dictionary of Names. * *Special Publication 440, National Bureau of Standards, Washington, DC 20402, USA.		Smoke emission (Co	ontinuous/Intermit	tent)
				Comments/Observat	tions	

1 uge 202			
	Manufacturer:	_ Date:	Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.3.7.2 100 mm immersion for 5 min test	3.3.7.2 100 mm immersion for 5 min test			0) 1/4.3.2	
Test Procedure	Acceptance Criteria			Significant Test Dat	ta
Three specimens of smoke signals should be	l be After conditioning each specimen should no sign of damage such		16	17	18
immersed in the ready to fire condition for 5 minutes under 10 cm of water and than	as shrinking, cracking, swelli mechanical properties.	ng, dissolution or change of	Condition (Pass/Fa	ail) I	
subjected to the function test at ambient			Smoke emission ti	ime (min/sec)	1
temperature.	The three specimens should fund smoke of a highly visible colour	at a uniform rate for a period of	Smoke emission to	(mm/sec)	
	not less than 3 minutes when float	ting in calm water.	Smoke colour (Pas	ss/Fail)	,
	The buoyant smoke signal should n				
	accordance with the manufacturers instructions, not emit any flame during the entire smoke emission time. The colour of the smoke should be orange as defined by section 34, 48, 49 or 50 of the publication Colour: Universal Language and Dictionary of Names. * *Special Publication 440, National Bureau of Standards Washington, DC 20402, USA.		Time delay (if app	olicable) (sec)	
		he orange as defined by sections	Smoke emission (continuous/Intermit	tent)
			Smoke emission (Continuous/ Internit	
		ational Bureau of Standards,	Comments/Observ	vations	
			Passed	Failed	

Passed _____ Failed _____

						Page 2
	Manufactur	er:	Date:		Time:	
Buoyant Smoke Signals	Model:		Surveyor:			
	Lot/Serial N	Jumber:	Organization:			
3.3.7.3 Salt spray test			Regulations: LSA Code I/1.2 &	III/3.3; MSC.81(7	0) 1/4.4.1	
Test Procedure		Acceptan	ce Criteria		Significant Test Data	ı
Three specimens of smoke sign:	al should be	After conditioning each specime	n should no sign of damage such	19	20	21
subjected to a salt spray (5% natr			ing, dissolution or change of	Condition (Pass/Fa	ail)	
solution) at a temperature of +3		mechanical properties.				
least 100 h and than subjected to test at ambient temperature.	the function	The three specimens should function correctly, they should emit		Smoke emission time (min/sec)		
test at amolent temperature.		smoke of a highly visible colour at a uniform rate for a period of				
		not less than 3 minutes when floating in calm water		Smoke colour (Pass/Fail)		
		The buoyant smoke signal should	I not ignite explosively when used			
			cturer instructions, nor emit any	Time delay (if applicable) (sec)		
		flame during the entire smoke em	ission time.			
		The colour of the smoke should be orange as defined by sections		Smoke emission (Continuous/Intermittent)		
34, 48, 49 or 50 of the publication Colour: Dictionary of Names. *		n Colour: Universal Language and				
		Dictionary of Names.		Comments/Observ	vations	
		*Special Publication 440, National Bureau of Standards, Washington, DC 20402, USA.				
				1		

compound

Note:- Natrium and Sodium are the same

1 age 201			
	Manufacturer:	_ Date:	Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.3.8.1 2 m Drop Test		Regulations: LSA Code I/1.2 &	III/3.3; MSC.81(70)) 1/4.4.1		
Test Procedure	Acceptance Criteria		Significant Test Data			
Three specimens of buoyant smoke signal should be dropped in turn end-on and horizontally from a height of 2 m on to a steel plate about 6 mm thick cemented on to a	smoke of a highly visible colour not less than 3 minutes when float	ot less than 3 minutes when floating in calm water		22 23 24 Condition (Pass/Fail)		
plate about 6 mm thick cemented on to a concrete floor. The three specimens should remain in a safe condition after the 2 m Drop Test and should function effectively.	in accordance with the manufacture flame during the entire smoke emperator. The colour of the smoke should 34, 48, 49 or 50 of the publication Dictionary of Names. *	I not ignite explosively when used turer's instructions, nor emit any ission time. be orange as defined by sections in Colour: Universal Language and sational Bureau of Standards,	Smoke emission to Smoke colour (Pass Time delay (if app Smoke emission (Comments/Observe)	ss/Fail) licable) (sec) Continuous/Intermi	ttent)	
			Passed	Failed		

3.3.8.2 Immersion suit glove test		Regulations: LSA Code I/1.2 & III/3.3; MSC.810	(70) 1/4.4.2
	Lot/Serial Number:	Organization:	
Buoyant Smoke Signals	Model:	Surveyor:	
	Manufacturer:	Date:	Time:

3.3.8.2 Immersion suit glove test	3.3.8.2 Immersion suit glove test Regulations) 1/4.4.2	
Test Procedure	Test Procedure Acceptance Criteria		Significant Test Data		
	Acceptance The three specimens should be effectively without injury to the proximity, during firing or burning. The three specimens should function smoke of a highly visible colour not less than 3 minutes when float. The buoyant smoke signal should in accordance with the manufact flame during the entire smoke emit. The colour of the smoke should be 34, 48, 49 or 50 of the publication Dictionary of Names. * *Special Publication 440, Nawashington, DC 20402, USA.	ce capable of being operated operator, or any person in close operator, or any should emit at a uniform rate for a period of ing in calm water not ignite explosively when used urer's instructions, nor emit any ssion time. be orange as defined by sections operator. Colour: Universal Language and	19 Condition (Pass/Fa Glove operation (P Smoke emission ti Smoke colour (Pas Time delay (if app	Significant Test Data 20 cil) cass/Fail) me (min/sec) s/Fail) licable) (sec) Continuous/Intermitt	21
			Passed	Failed	

1 uge 200			
	Manufacturer:	_ Date:	Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.3.9 Heptane test	Regulation	ons: LSA Code I/1.2 & I	III/3.3; MSC.81(70) 1/4.8.2		
Test Procedure	Acceptance Criteria			Significant Test Data	1
Three smoke signals should function in water covered by 2 mm layer of heptane. The test should be conducted at a water temperature of +20°C to +25°C. The smoke signal should be allowed to burn completely.	Acceptance Criteria The three specimens should not ignite the emit smoke of a highly visible colour at a un of not less than 3 minutes when floating in ca The buoyant smoke signal should not ignite in accordance with the manufacturer's instr flame during the entire smoke emission time. The colour of the smoke should be orange at 34, 48, 49 or 50 of the publication Colour: U Dictionary of Names. *	iform rate for a period alm water explosively when used uctions, nor emit any as defined by sections	Heptane ignition Smoke emission t Smoke colour (Pas	23 (Pass/Fail) time (min/sec) ss/Fail)	24
	*Special Publication 440, National Bi Washington, DC 20402, USA.	ureau of Standards,	Smoke emission (comments/Observer) Passed	continuous/Intermitt vations	ent)

	Manufacturer:	Date:	_ Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.3.10 Laboratory smoke obscuration test		Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.8.3		
Test Procedure Acceptance Criteria		e Criteria	Significant Test Data	
Three additional specimens from the same lot should be used. Laboratory testing of the smoke signal should establish that at least 70% obscuration throughout the minimum emission time is attained when the smoke is drawn through a 19 cm diameter duct by a fan capable of producing an entrance air flow of 18.4 m³/min.	The testing laboratory report shobscuration rate throughout the mimaintained.		Laboratory Testing Report No. Report acceptable (Yes/No) Smoke obscuration rate achieved at -30°C% Burning time of smoke signal sec Smoke obscuration rate achieved at +20°C% Burning time of smoke signal sec Smoke obscuration rate achieved at +65°C% Burning time of smoke signal sec Comments/Observations	

1 uge 200			
	Manufacturer:	_ Date:	Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.3.11 Wave test	Regulations: LSA Code I/1.2 &	III/3.3; MSC.81(70	0) 1/4.8.4	
Test Procedure	Acceptance Criteria	Significant Test Data		
		Significant Test Data		
		Comments/Observer		

	Manufacturer:	Date:	_ Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.3.12 Liferaft drop test Regula			ntions: LSA Co	nde 1.2 & 4.1.1	.2	
-		Regulations: LSA Code 1.2 & 4.1.1.2 nce Criteria Significant Test Data				
The liferaft in the operationally packed		nent is acceptable subject to the at the operational efficiency has	25	26		
condition should be suspended and then dropped from a height of 18 m into the water.	not been impaired.		Condition of units (Pass/Fail)			
If the liferaft is to be stowed at a height greater than 18 m above the waterline in the lightest seagoing condition, it should be dropped from						
the height at which it is to be stowed.	After the test, each rocket parach	t parachute flare should show no sign of ing, cracking, swelling, dissolution or lities.	Comments/O	bservations		
Note:- This test sheet should be completed by the liferaft manufacturer. Reference should be made to the test sheet 4.2.4.						

	Manufacturer:	_ Date:	Time:
Buoyant Smoke Signals	Model:	Surveyor:	
	Lot/Serial Number:	Organization:	

3.3.	13 Safety Inspection		Regulations: LSA Code I/1.2 &	III/3.3; MSC.81(70) 1/4.5	
Test Procedure		Acceptance Criteria		Significant Test Data	
It should be established by visual inspection that the buoyant smoke signal: -					
1.	is indelibly marked with clear and precise instructions on how it should be operated and that the danger end can be identified by day or night;	Clear and precise operating instructions smoke signal and the buoyant sm danger end.	•	Markings and identification of ends acceptable Passed Failed	
2.	can, if hand operated, be operated from the bottom (safe end) or that it contains an operational safety delay of 2 seconds;	It operated from the top the time delay is not to be less than 2 s.		Time delay if operated from the top sec	
3.	has a simple and integral means of ignition which requires the minimum of preparation and can be readily operated in adverse conditions without external aid and with wet, cold or gloved hands;	It has a simple means of ignition and gloved hands.	and can be operated by cold, wet	Operation of specimen when wet, cold and gloved hands. Passed Failed	
4.	does not depend on adhesive tapes or plastic envelopes for its water resistant properties; and	Adhesive tapes or plastic envelope resistant properties.	es are not used to maintain water-	Water resistant without the use of envelopes or adhesive tape. Passed Failed	
5.	can be indelibly marked with means of determining its age.	Date of manufacturing and date of outside.	of expiry indelible printed on the	Buoyant smoke signal indelible date stamped. Passed Failed Comments/Observations	
